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**1992 ALBERTA HOUSE COST COMPARISON STUDY
24 UNIT WALK-UP APARTMENT**

NOVEMBER 1992



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1992 ALBERTA HOUSE COST COMPARISON STUDY 24 UNIT WALK-UP APARTMENT

NOVEMBER 1992

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PREFACE

The purpose of the 1992 Alberta House Cost Comparison Study was to estimate the hard construction costs of a typical single detached dwelling in ten urban centres across the Province and a 24 unit walk-up apartment building in Calgary and Edmonton.

The study also compared current 1992 construction costs with those of previous years in the selected urban centres. Emphasis was given to comparing 1992 costs with 1991 costs and the study includes an analysis of the differences. The cost impact of changes in Building Code provisions contained in the 1990 Alberta Building Code was also addressed.

The study was carried out by the firm of NRE Cost Consultants and is documented in three reports:

1992 Alberta House Cost Comparison Study:	Executive Summary
1992 Alberta House Cost Comparison Study:	Single Detached Dwelling
1992 Alberta House Cost Comparison Study:	24 Unit Walk-up Apartment

Additional copies of any of these reports can be ordered from

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1.0 INTRODUCTION

1.1 Objectives

The objectives of the 1992 Alberta House Cost Comparison Study are:

1. To determine 1992 base residential construction costs for single detached attached houses in Alberta.
2. To determine reasons for differences in residential construction costs of the single and attached.
3. To determine detailed breakdown of 1992 residential construction costs with 1991 costs for each area.
4. To determine and estimate impact of inflation on construction costs from the last twelve years in each area.
5. To determine the cost impact of the 1992 Alberta Building Code.

1.0 INTRODUCTION

1.1 Scope of Work

The 1992 Study identified the construction costs for a typical single detached detached and a 30 unit multi-unit apartment building.

The study was limited to three reports:

1992 Alberta House Cost Comparison Study - Single Detached

1992 Alberta House Cost Comparison Study - Single Attached

1992 Alberta House Cost Comparison Study - 30 Unit Apartment Building

This report deals with the 30 Unit Apartment Building. The study was a three month project involving extensive field work across the province. The study was done from the perspective of the contractor and the owner.

1.0 INTRODUCTION

1.1 Objectives

The objectives of the 1992 Alberta House Cost Comparison Study were:

1. To determine 1992 hard residential construction costs in various selected urban centres in Alberta.
2. To determine reasons for differences in residential construction costs in the selected centres.
3. To carry out detailed comparisons of 1992 residential construction costs with 1991 costs in each centre.
4. To determine and comment upon residential construction cost trends over the last twelve years in each centre.
5. To determine the cost impact of the 1990 Alberta Building Code.

1.2 Scope of Work

The 1992 Study examined the construction costs of a typical single detached dwelling and a 24 unit walk-up apartment building.

The study has been documented in three reports:

1992 Alberta House Cost Comparison Study: Executive Summary

1992 Alberta House Cost Comparison Study: Single Detached Dwelling

1992 Alberta House Cost Comparison Study: 24 Unit Walk-up Apartment

This report deals with the 24 Unit Walk-Up Apartment Building. This building is a basic four-storey (including basement) walk-up, with normal foundations, slab-on-grade, flat roof, wood frame construction, basic mechanical and electrical systems and basic finishes.

1.0 INTRODUCTION

1.2 Scope Of Work (continued)

The study examined apartment building construction costs in the following urban centres:

1. Calgary
2. Edmonton

The cost analysis examined the construction cost differences between the cities and identified reasons for those differences with reference to such factors as:

- a) material costs,
- b) labour costs,
- c) building features and inclusions,
- d) construction specifications,
- e) recent market activity and
- f) other local factors as appropriate.

Cost estimates for the 24 unit walk-up apartment for the two centres include all structural, finishing, mechanical and electrical work as shown and specified on the drawings. Costs have not been included for the following items:

- | | |
|-----------------------------------|------------------------------------|
| a) land cost and site clearance, | e) legal fees and disbursements, |
| b) site servicing, | f) marketing and real estate fees, |
| c) site development, | g) financing costs. |
| d) design fees and disbursements, | |

1.0 INTRODUCTION

1.3 Drawings

The drawings of the 24 unit walk-up used for the study consist of:

1. Site plan
2. Foundation plan
3. Basement floor plan
4. Main floor plan
5. 2nd and 3rd floor plan
6. Building elevations
7. Section and details
8. Basement floor plan - Mechanical layout
9. Main floor plan - Mechanical layout
10. 2nd and 3rd floor plan - Mechanical layout
11. Basement floor plan - Electrical layout
12. Main floor plan - Electrical layout
13. 2nd and 3rd floor plan - Electrical layout

Reduced copies of these drawings are attached as an Appendix.

1.4 Approach

Costs are provided in this report under the headings of "Labour Item Cost" and "Material/Equipment Item Cost". The breakdowns between labour and material/equipment costs were provided by the applicable trade contractors. Labour costs were determined through research and discussion with those contractors. Where necessary, realistic assessments were made of current rates by examining the circumstances of the particular sub-trade and by reference to published labour/material costing data.

Material prices were established from the prices supplied by sub-trades directly and by builders' estimators. In addition, prices were solicited from suppliers and manufacturers based in each urban centre and average values calculated. Appropriate levels of discounts were applied as deemed appropriate.

1.0 INTRODUCTION

1.4 Approach (continued)

Prior to 1991 the apartment study covered ten urban centres. In 1991 the study was limited to Calgary and Edmonton. In addition, a revised format for presenting the costs was developed. These updates and revisions were made so as to better represent current trends and estimating practices in the residential construction industry.

Cost data are assembled by sub-trade and presented in 19 trade categories plus categories for site overhead and general contractor's overhead and profit. The sub-trade operations are combined within each trade in order to reflect industry estimating practice. The cost effects of market forces and residential construction industry conditions are addressed in Section 3.0 "Commentary".

1.5 Goods and Services Tax

The Goods and Services Tax (GST) replaced the Federal Sales Tax (FST) on January 1, 1991.

Up until December 31, 1990, FST had been levied only on materials and manufactured goods. The rates in effect on that date were, with minor exceptions, 9% or 13.5% depending on the classification of the item. Most materials used in apartment building construction were subject to the 9% tax although some, for example, carpet, were taxed at the higher rate. The rates of FST were subject to change and had been steadily increasing. In 1977, for example, the rate was only 5% and applied across the board.

GST is applied to all aspects of construction - labour, materials, overheads and profit. The item-by-item costs shown in this report for the years prior to 1991 are inclusive of FST. 1991 and 1992 item costs are exclusive of GST. In order to compare the 1991 and 1992 costs on a "tax-included" basis with those in previous years GST has been added in at 7%, the rate in effect in November 1992.

1.0 INTRODUCTION

1.6 The 1990 Alberta Building Code

Introduction

The Alberta Building Code is "primarily a code of minimum regulations for public health, fire safety and structural sufficiency but also contains other requirements deemed to be in the interest of the public and its well-being". Building codes are constantly being updated, typically every four or five years, to reflect changes in material standards and performances, in design codes, in standards for health and safety, and to regulate the use of new construction materials and techniques. By agreement with the National Research Council, Alberta is committed to using the National Building Code of Canada as its base document in regulating building standards.

In 1990 the latest version of the National Building Code was issued followed by the 1990 Alberta Building Code which applies specifically to building construction in the province, replacing the 1985 Alberta Building Code. It effectively came into use in late 1991 and governed all building construction in Alberta in the study year 1992. Many of the changes take the form of a restructuring of the code, providing standards for new materials introduced since 1985, and clarifying and expanding upon existing regulations. Most of the changes have no significant impact on the costs of constructing the apartment units in this study, but some do and these are identified below.

General Changes

The 1990 Alberta Building Code is very different from the 1985 edition in format. Numbering of sections, clauses and paragraphs has generally been amended and paragraphs and sentences reorganized; some sections of the 1985 code have been deleted and other sections added; the appendices are more comprehensive; there has been close coordination with the Alberta Fire Code; further references to material standard specifications have been added (for example, specification references for oriented strand board (OSB)).

In general, changes which have affected the building in this study relate to "barrier-free" construction, air and vapour barrier protection, residential ventilation, allowable spans for joists, rafters and beams, resistance to unlawful access, base material under concrete floors slabs, and requirements related to the use of gypsum wallboards on ceilings. Increased emphasis has been placed on the health and security of the resident. Some of these code changes have not necessarily resulted in cost increases to builders for several reasons. Many builders were already in the practice of building to or even beyond the minimum standards established by the new code - for example some builders have been using the more expensive "truss-joists" in floor construction and therefore were not impacted by the 'reduced span' tables; others had made it a practice of using 15.9 mm wallboard in ceilings instead of the previously allowable 12.7 mm. A second reason is the fact that compliance with code requirements is under the jurisdiction of local authorities who may exercise discretion in certain areas, for example in the use of suitable local materials for the sub-bases of slabs-on-grade.

1.0 INTRODUCTION

1.6 The 1990 Alberta Building Code (continued)

Changes Affecting Costs of the 24 Unit Walk-up Apartment

The following table identifies code changes which have had an impact on costs. Estimates of the costs associated with each change as it pertains to this study are provided in Table WA.13.

Description of Code Item

- Subsection 9.6.6 added - "Resistance to Forced Entry": This item deals with the construction of wood entry doors; specifies a deadbolt lock; specifies minimum fastening details for hinges and strikeplates; requires solid blocking between jambs and structural framing at lock height; and requires that door viewers be installed to main entrance doors.
- Subsection 9.7.6 added - "Resistance to Forced Entry": Windows to dwelling units which have any part located within 2 m of adjacent ground level shall conform to CSA-A440-M 'Windows' requirements for resistance to forced entry.
- Section 9.9 "Means of Egress": For residential projects funded in part or whole by the Government of Alberta barrier-free design requirements in Part 3 of the code will apply. Specifically this involves the provision of two barrier-free suites on the first floor with entrances, access and egress all meeting code stipulations. A handicap elevator is not required since the Suites can be close to grade level and thus permit ramp access.
- Article 9.13.1.2 - Dampproofing of concrete slabs-on-ground is now mandatory instead of discretionary.
- Article 9.16.2.1 - Clean granular material (min. thickness 100 mm) must be used under concrete slabs (except in garages) containing not more than 10% of material that will pass a 4 mm sieve (i.e. washed 20 mm gravel or rock). The 1985 code allowed use of other suitable material provided it was compacted.
- Subsection 9.23.4 "Allowable Spans" - New span tables for joists, rafters and beams which significantly affect wood-framed construction. Douglas Fir has been downgraded the most, but spruce and S-P-F categories of lumber have also been affected. For example, 2" x 10" Douglas Fir floor joists placed at 400 mm centres had maximum allowable spans of 5.05 m under the 1985 code. The span has been reduced to 4.38 m in the 1990 code. #2 Spruce at 400 mm centres could span up to 4.46 m under the 1985 code but only 4.17 m under the 1990 code.

1.0 INTRODUCTION

1.6 The 1990 Alberta Building Code (continued)

Description of Code Item

- Subsection 9.23.12 "Framing over Openings" - New span table added: "Built-up Wood Lintels Supporting Roof and Ceiling Loads over Large Openings"
- Subsections 9.23.14, 15, 16 "Subflooring", "Roof Sheathing" and "Wall Sheathing" - Minor changes, material specifications added.
- Section 9.25 "Thermal Insulation and Control of Condensation" - New General Clauses added entitled "Required Insulation", "Barrier to Air Leakage", and "Barrier to Vapour Diffusion" reflecting the increased importance the 1990 code brings to this item. Under the 1985 code builders were typically using standard 4 mil or 6 mil polyethylene sheet to provide the necessary vapour barrier on external walls and ceilings. The 1990 code stipulates that the sheet must conform to CGSB-51.34-M, a significantly more expensive material which meets a much 'tighter' performance standard. A single sheet may provide the required barrier for both air and vapour. Prevention of air leakage has become more strictly controlled requiring the use (as before) of poly pans around electrical outlets, adequate laps, etc.
- Sections 9.26 "Roofing", 9.27 "Siding" - Minor changes with no cost implications.
- Subsection 9.29.5 "Gypsum Board Finish (Taped Joints)" - Table "Maximum Spacing of Supports for Gypsum Boards" has been added. The major change is that 12.7 mm (1/2") GWB may not be used for textured ceilings if the supports are the standard 600 mm. The 1990 code stipulates that 15.9 mm (5/8") board must be used. (Special 'ceiling board' may also be used in lieu of the 15.9 mm board).
- Section 9.30 "Flooring" - Minor changes.
- Section 9.31 "Plumbing Facilities" (Part 7 applies) - Minor changes.
- Section 9.32 "Ventilation" - Requirements for mechanical ventilation.
- Section 9.33 "Heating and Air-Conditioning" - Minor changes.
- Section 9.34 "Electrical Facilities" - Minor changes.

2.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

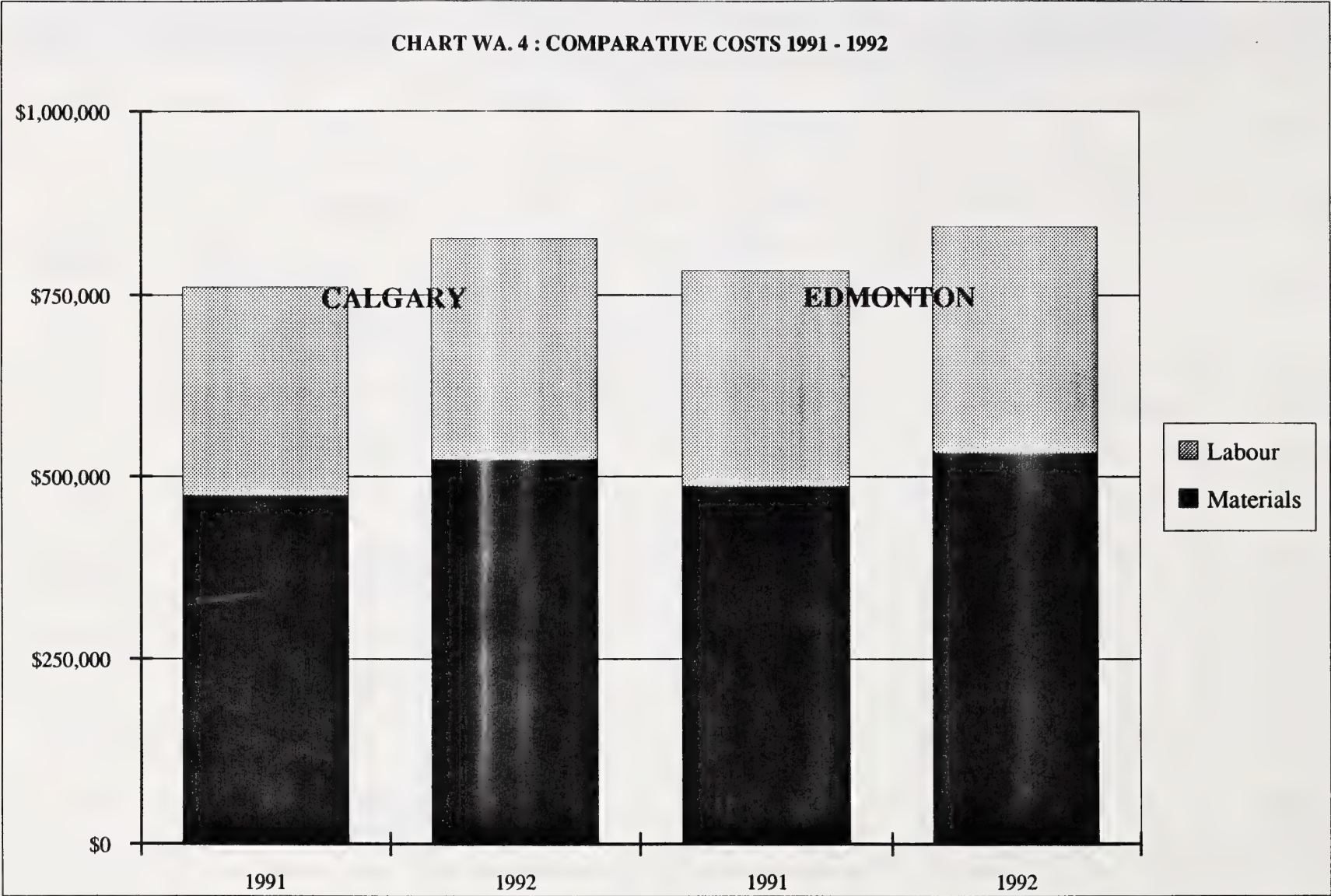
2.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

TABLE WA.1 TOTAL BUILDING COSTS		
ITEM	CALGARY	EDMONTON
Labour	\$304,031	\$310,176
%	36.8%	36.8%
Material	\$523,220	\$533,087
%	63.2%	63.2%
Total 1992	\$827,251	\$843,263
Cost / m2	\$445.48	\$454.10
Cost / sq.ft.	\$41.39	\$42.19
Total 1991	\$761,274	\$783,830
Cost / sq.ft.	\$38.09	\$39.22
% Change from 1991	8.7%	7.6%

TABLE WA.2 COMPARATIVE COST RATIOS		
LOCATION	CALGARY	EDMONTON
CALGARY	1.00	1.02
EDMONTON	0.98	1.00

TABLE WA.3 COMPARATIVE COSTS 1991 - 1992		
ITEM	CALGARY	EDMONTON
Labour Cost		
1992	\$304,031	\$310,176
1991	\$287,767	\$297,002
Difference	\$16,264	\$13,174
% Difference	5.7%	4.4%
Material Cost		
1992	\$523,220	\$533,087
1991	\$473,507	\$486,828
Difference	\$49,713	\$46,259
% Difference	10.5%	9.5%
Total Cost		
1992	\$827,251	\$843,263
1991	\$761,274	\$783,830
Difference	\$65,977	\$59,433
% Difference	8.7%	7.6%

2.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT



2.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

**TABLE WA.5 : COMPARATIVE TOTAL BUILDING COSTS
1981 - 1992 (Nominal Dollars)**

YEAR	AVERAGE	CALGARY	EDMONTON
1981	\$716,748	\$719,003	\$714,492
1982	\$646,559	\$627,844	\$665,273
1983	\$597,610	\$592,174	\$603,046
1984	\$595,950	\$591,861	\$600,039
1985	\$621,512	\$617,049	\$625,974
1986	\$647,835	\$647,135	\$648,534
1987	\$709,010	\$724,502	\$693,517
1988	\$735,201	\$744,420	\$725,982
1989	\$786,666	\$792,405	\$780,927
1990	\$828,285	\$832,328	\$824,241
1991	\$772,552	\$761,274	\$783,830
1992	\$835,257	\$827,251	\$843,263

**TABLE WA.6 : COMPARATIVE TOTAL BUILDING COSTS
1981 - 1992 (Inflation-Adjusted Dollars)**

YEAR	AVERAGE	CALGARY	EDMONTON
1981	\$1,162,981	\$1,163,880	\$1,162,081
1982	\$935,427	\$898,651	\$972,204
1983	\$822,440	\$811,665	\$833,216
1984	\$805,244	\$796,517	\$813,972
1985	\$809,474	\$802,992	\$815,956
1986	\$819,683	\$817,673	\$821,693
1987	\$856,767	\$875,093	\$838,441
1988	\$869,718	\$880,594	\$858,841
1989	\$890,240	\$900,201	\$880,280
1990	\$891,771	\$894,008	\$889,534
1991	\$783,740	\$770,439	\$797,041
1992	\$835,257	\$827,251	\$843,263

2.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

**TABLE WA.7 : COMPARATIVE COSTS PER UNIT
1981 - 1992 (Nominal Dollars)**

YEAR	AVERAGE	CALGARY	EDMONTON
1981	\$29,864	\$29,958	\$29,771
1982	\$26,940	\$26,160	\$27,720
1983	\$24,900	\$24,674	\$25,127
1984	\$24,831	\$24,661	\$25,002
1985	\$25,896	\$25,710	\$26,082
1986	\$26,993	\$26,964	\$27,022
1987	\$29,542	\$30,188	\$28,897
1988	\$30,633	\$31,018	\$30,249
1989	\$32,778	\$33,017	\$32,539
1990	\$34,512	\$34,680	\$34,343
1991	\$32,190	\$31,720	\$32,660
1992	\$34,802	\$34,469	\$35,136

**TABLE WA.8 : COMPARATIVE COSTS PER UNIT
1981 - 1992 (Inflation-Adjusted Dollars)**

YEAR	AVERAGE	CALGARY	EDMONTON
1981	\$48,458	\$48,495	\$48,420
1982	\$38,976	\$37,444	\$40,509
1983	\$34,268	\$33,819	\$34,717
1984	\$33,552	\$33,188	\$33,915
1985	\$33,728	\$33,458	\$33,998
1986	\$34,153	\$34,070	\$34,237
1987	\$35,699	\$36,462	\$34,935
1988	\$36,238	\$36,691	\$35,785
1989	\$37,093	\$37,508	\$36,678
1990	\$37,157	\$37,250	\$37,064
1991	\$32,656	\$32,102	\$33,210
1992	\$34,802	\$34,469	\$35,136

2.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

**TABLE WA.9 : COMPARATIVE SQUARE FOOT COSTS
1981 - 1992 (Nominal Dollars)**

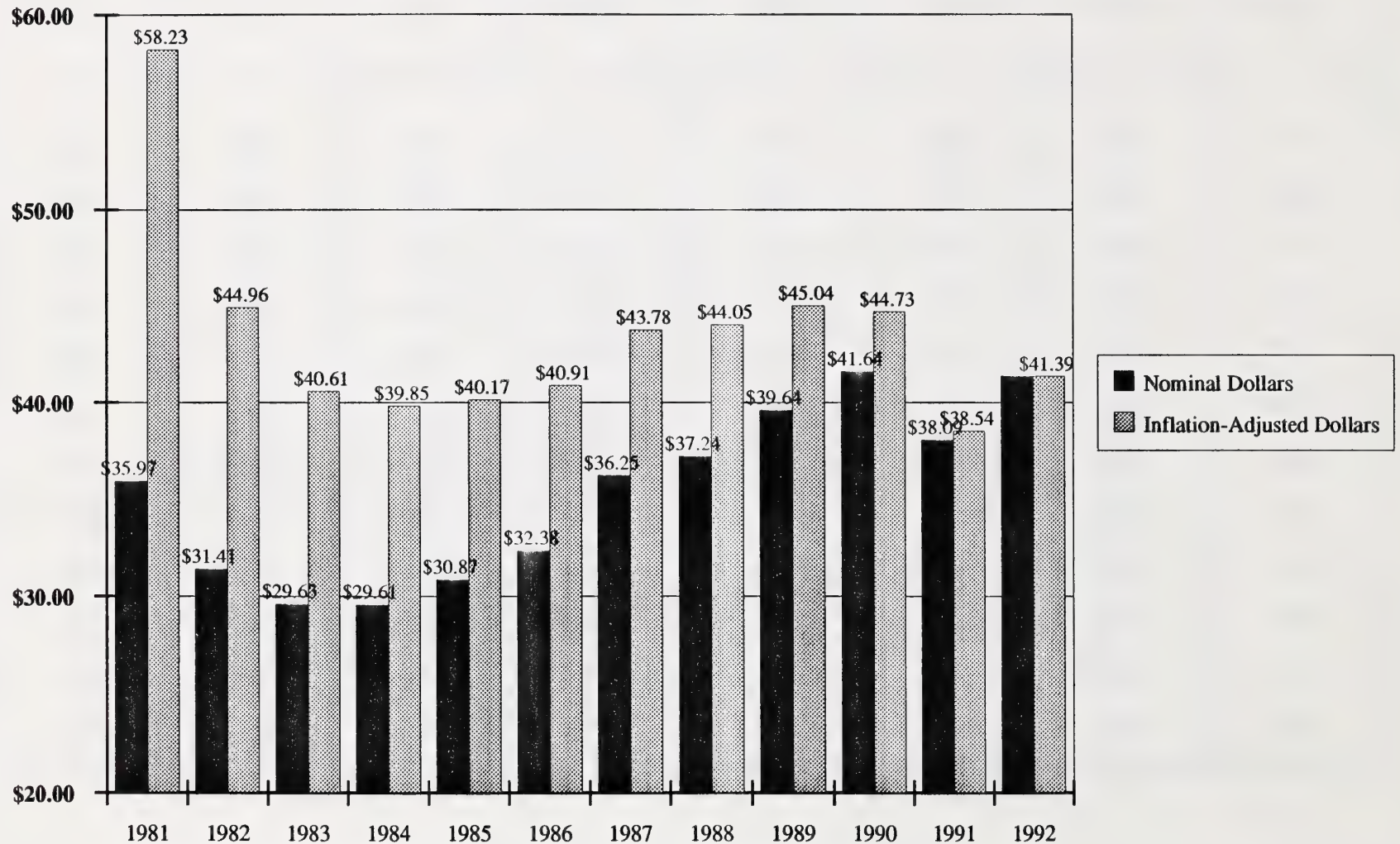
YEAR	AVERAGE	CALGARY	EDMONTON
1981	\$35.86	\$35.97	\$35.75
1982	\$32.35	\$31.41	\$33.28
1983	\$29.90	\$29.63	\$30.17
1984	\$29.81	\$29.61	\$30.02
1985	\$31.09	\$30.87	\$31.32
1986	\$32.41	\$32.38	\$32.45
1987	\$35.47	\$36.25	\$34.70
1988	\$36.78	\$37.24	\$36.32
1989	\$39.36	\$39.64	\$39.07
1990	\$41.44	\$41.64	\$41.24
1991	\$38.65	\$38.09	\$39.21
1992	\$41.79	\$41.39	\$42.19

**TABLE WA.10 : COMPARATIVE SQUARE FOOT COSTS
1981 - 1992 (Inflation-Adjusted Dollars)**

YEAR	AVERAGE	CALGARY	EDMONTON
1981	\$58.18	\$58.23	\$58.14
1982	\$46.80	\$44.96	\$48.64
1983	\$41.15	\$40.61	\$41.68
1984	\$40.29	\$39.85	\$40.72
1985	\$40.50	\$40.17	\$40.82
1986	\$41.01	\$40.91	\$41.11
1987	\$42.86	\$43.78	\$41.95
1988	\$43.51	\$44.05	\$42.97
1989	\$44.54	\$45.04	\$44.04
1990	\$44.61	\$44.73	\$44.50
1991	\$39.21	\$38.54	\$39.87
1992	\$41.79	\$41.39	\$42.19

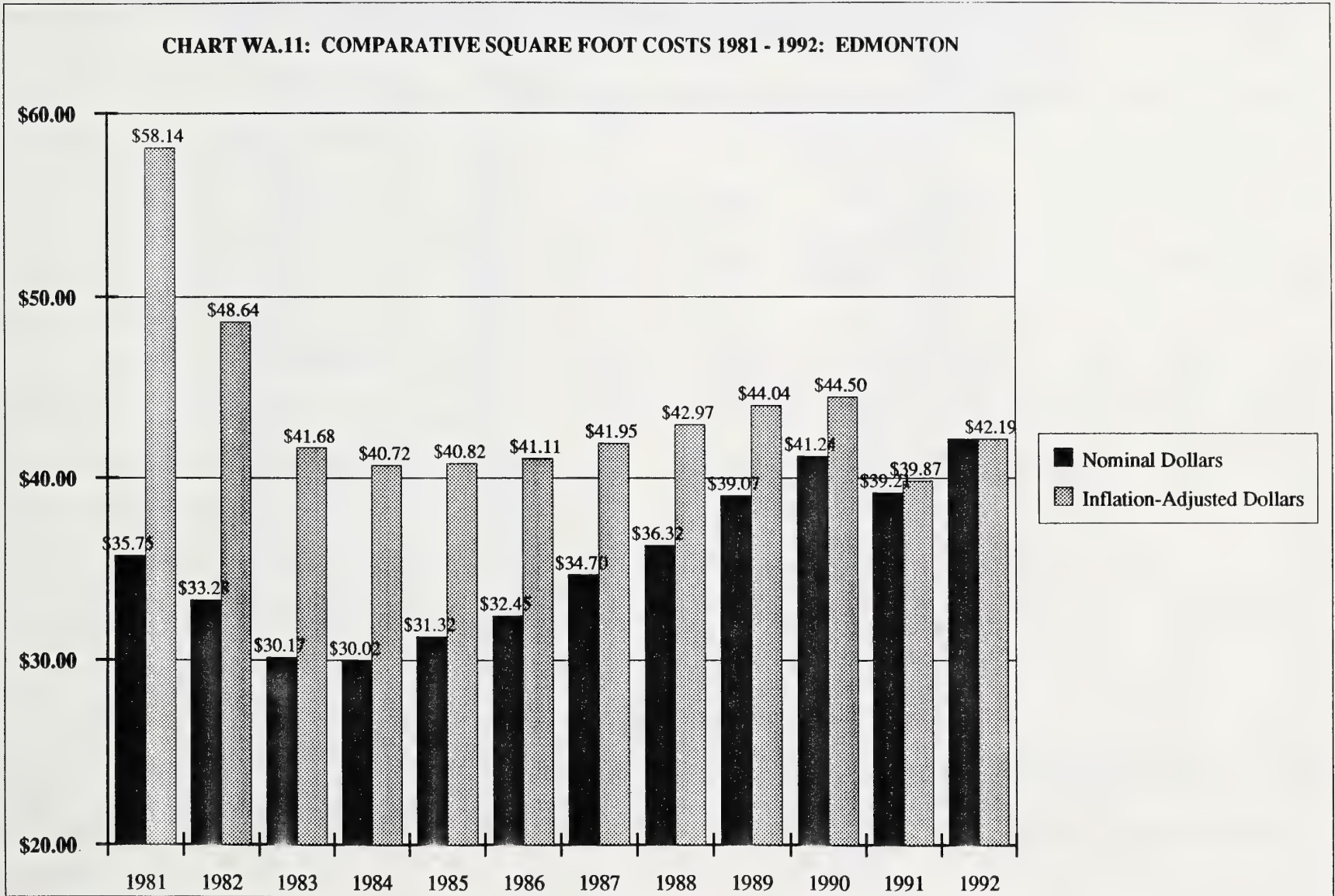
2.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

CHART WA.11: COMPARATIVE SQUARE FOOT COSTS 1981 - 1992: CALGARY



2.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

CHART WA.11: COMPARATIVE SQUARE FOOT COSTS 1981 - 1992: EDMONTON



2.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

TABLE WA.12 : TRADE DIVISION COST SUMMARIES		
TRADE	CALGARY	EDMONTON
1. Excavation & Backfill	5,208	5,126
2. Concrete & Gravel	24,485	26,480
3. Rough Carpentry	99,669	100,440
4. Roofing	17,545	17,570
5. Windows & Doors	29,118	31,870
6. Exterior Cladding	16,978	17,049
7. Plumbing	70,800	73,800
8. Electrical	54,000	55,560
9. Heating	45,600	46,800
10. Ventilation	29,400	29,400
11. Fire Protection	3,000	3,120
12. Specialty Items	11,121	11,262
13. Drywall, Insulation & Caulking	56,565	57,417
14. Cabinets & Vanities	49,455	49,200
15. Interior Finishing	53,015	53,718
16. Painting, Stain & Lacquer	22,793	22,092
17. Floor Coverings	52,035	52,687
18. Ceramic Tile	6,165	6,165
19. Appliances	33,060	34,140
20. Site Overhead	49,440	51,840
21. General Contractor's Overhead & Profit	43,680	42,360
Sub-Total	773,132	788,096
Goods & Services Tax	54,119	55,167
TOTAL	\$827,251	\$843,263

2.0 SUMMARY OF FINDINGS FOR THE 24 UNIT WALK-UP APARTMENT

TABLE WA.13: AVERAGE COST IMPACT OF THE 1990 ALBERTA BUILDING CODE

Description of Item and Change			Change in	Change in	Change in	Change in	Change in	Change in
	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
150mm clean washed gravel under slab-on-grade to be used in place of finer materials.	70	m3	3.50	245	10.00	700	13.50	945
Barrier free provisions - provide handicap access - concrete ramp to main entrance (Allowance).	1	No.	900.00	900	1,600.00	1,600	2,500.00	2,500
Barrier free provisions - provide handicap plumbing fixtures and special walk-in shower stall in two suites (Allowance).	2	apt.	300.00	600	2,800.00	5,600	3,100.00	6,200
Barrier free provisions - provide grab bars in suites.	2	apt.	75.00	150	250.00	500	325.00	650
Barrier free provisions - special hardware to building entrances (Allowance).	4	sets	100.00	400	550.00	2,200	650.00	2,600
Barrier free provisions - provide lever sets to suite doors.	2	apt.	20.00	40	120.00	240	140.00	280
New span tables for all lumber - shorter permissible spans - replace 38 mm x 235 mm floor and roof joists with 235 mm truss joists.	5,300	m	0.00	0	0.90	4,770	0.90	4,770
Additional labour associated with changes in permissible spans, etc.	1,857	m2	1.25	2,321	0.00	0	1.25	2,321
Air and vapour barrier - increased standard. More costly polyethylene sheet is to be used.	1,926	m2	0.00	0	0.22	424	0.22	424
SUBTOTALS	11.14 /m2 GFA			4,656		16,034		20,690
GOODS & SERVICES TAX	0.78 /m2 GFA			326		1,122		1,448
TOTALS	11.92 /m2 GFA			4,982		17,156		22,138

3.0 COMMENTARY

3.0 COMMENTARY

3.1 General

Economic Factors

The current recession which took hold in late 1990 and deepened during 1991 has continued throughout 1992. All sectors of the economy have been affected, including the natural resources industries. Oil prices, which have a significant impact on the Alberta economy and the ability of the Alberta government to finance construction projects, have remained at approximately US\$ 20 - 22 throughout 1992; a fraction, in real terms, of the level they were at in the early 1980s. Major oil companies and associated service companies have continued to downgrade their operations which has meant higher unemployment and more demand on expenditures in the social services. Government has therefore been unable to stimulate the economy by embarking on a program of capital construction. The dearth of such government activity has resulted in general contractors and all sub-trades bidding at the lowest possible levels in order to secure work and maintain some semblance of cash flow.

In a report on the construction industry in Canada issued in November of 1992, Statistics Canada stated that the construction industry has been hit even harder than the manufacturing and natural resources industries. Reporting on the industry nationally, Statistics Canada said "Construction spending contracted faster in 1990-91 than any other sector of the economy and continued to decline into 1992, raising unemployment in construction to the highest of any industry".

In another comment it was stated: "In fact, and this may surprise many, it is rare for non-residential construction to contract at all during recessions. When it does, however, the recession is likely to be quite severe and result in large job losses, as occurred in 1981-82 and in the latest downturn".

While overall construction activity in Alberta has declined, the housing market has rebounded from the low levels of 1991. Data obtained from the civic departments responsible for building permits in Calgary and Edmonton are presented in the table on the following page. The numbers shown represent the number of apartment *units* constructed during the periods, not the number of apartment buildings built. Comparisons of the numbers of permits issued in the nine month period ending September 30 in each of 1992 and 1991 and for the entire year in 1991 and 1990 are provided.

As can be seen, the number of units declined in 1991 from the 1990 levels by an average of 52% while the first nine months of 1992 showed an increase averaging 102% over 1991. Assuming the same level of activity for the last three months of 1992, the total number of units in both cities in 1992 will reach a figure of about 750 which is substantially higher than the 1991 total of 518 but lower than the 1990 total of 1,071.

3.0 COMMENTARY

3.1 General (continued)

MULTI-FAMILY (APARTMENT UNITS) BUILT

Urban Centre	Jan-Sep 1992	Jan-Sep 1991	%	1991	1990	%
Calgary	161	123	+31%	234	436	-46%
Edmonton	404	157	+157%	284	635	-55%
Totals	565	280	+102%	518	1,071	-52%

Despite the fact that residential construction was much healthier during 1992 than in 1991, costs of construction did not rise to the extent that might have been expected. One reason is that general inflation levels were low throughout 1992, in the order of 1.5% per annum. But the principal reason is the low level of activity in non-residential construction which has kept the supply of labour, materials and equipment available for construction as a whole at far higher levels than the total demand. As noted previously, unemployment among construction workers remained high and the oversupply in Alberta was exacerbated by an influx of migratory tradespeople and labour from other provinces and by the continuing entry into the Alberta market of out-of-province contractors.

It was concluded, from comments made by builders and sub-trades in the course of collecting information for this study, that it is very probable costs of construction will sharply increase when the current recession is finally over. There was a strong indication that the low prices and profit levels which have been the norm over the past two years cannot be maintained for too much longer.

3.0 COMMENTARY

3.1 General (continued)

Labour Costs

Residential construction is generally performed by non-union labour, much of it by self-employed tradesmen and small contractors. Rates paid by building contractors are driven by market forces. Only to a small degree are they influenced by union-negotiated rates for labour employed by governments, municipalities and certain industries.

The cost of labour in apartment building construction remained stable during 1992 despite a slight increase in the cost of living and increases in payroll burden from higher CPP, UIC and Workers' Compensation levies. Increases in labour cost, if any, have been minimal although no actual decreases were reported. Independent contractors were generally forced to increase their productivity to realize the same rewards.

Material Costs

Material prices increased modestly over the study period. Generally, this increase was at the level of general inflation or slightly higher. Certain items increased more than others while some remained at the same level as in 1991. A detailed survey of suppliers produced the following conclusions:

- Lumber prices fluctuated wildly on a seasonal basis throughout the year and, in fact, varied from month to month. In September and October the prices of dimensional lumber, plywood and manufactured boards increased sharply due to the sudden demand caused by Hurricane Andrew. By November, prices had fallen to near pre-disaster levels. Lumber suppliers often protect their regular customers from such wild swings in prices, nevertheless there was a general increase reported in the cost of studs, dimensional lumber and manufactured trusses in the order of 10% to 25% over 1991 prices.
- Windows and exterior doors were generally reported to cost more than in 1991. Increases in the order of 3% to 4% were standard. Increases in the cost of interior doors were nominal. Interior finishing materials, however, also increased in price by approximately 5%. The price of ready-mixed concrete was also higher. Reported increases ranged from a low of 3% to a high of 10% with an average range of 4 - 6%. The only other materials showing a significant increase were drywall board and fibreglass batt insulation with an average upward movement of 5%.

It should be noted that, while supplier prices may be higher or lower than the year previous, cost savings or increases may not necessarily be passed on in full. Market forces determine the price and many sub-contractors absorb their increased costs in order to remain competitive.

3.0 COMMENTARY

3.2 Impact of the 1990 Alberta Building Code

The changes brought about by the 1990 Alberta Building Code had a significant impact on the construction costs of the 24 unit apartment. The average net increase in cost was approximately \$22,000 including GST. Since the footprint area of the study building is less than 600 sq.m. the building is governed by Part 9 of the code (Housing and Small Buildings) and therefore it does not have to be sprinklered. The cost of sprinklering the building would have added approximately \$24,000 (\$1,000 per unit).

An overview of code changes has been provided in Section 1.0 and the cost impact detailed in Section 2.0 (Table WA.13) of this report.

Code-related costs have added approximately 3% to the total costs of constructing the building.

3.3 Highlights by Centre

Residential construction activity in Calgary during 1992 was significantly higher than in 1991. The bulk of activity was in single-family housing. Multi-unit projects were mainly aimed at the higher end of the market and included town houses and condominiums. Costs of the 24 unit walk-up apartment increased fairly substantially, partly due to the more stringent code and other regulatory requirements.

The same general comments for Calgary also apply to Edmonton where activity in apartment construction was greater and at more modest standards than in Calgary. The increases in costs for the study building can be attributed to market forces and, to a lesser extent, the impact of the 1990 code.

Calgary

Total cost of construction	\$827,251
Cost per unit	\$34,469
Cost per square foot	\$41.39
Increase over 1991	8.7%
Increase in labour cost	5.7%
Increase in material/equipment cost	10.5%

Edmonton

Total cost of construction	\$843,263
Cost per unit	\$35,136
Cost per square foot	\$42.19
Increase over 1991	7.6%
Increase in labour cost	4.4%
Increase in material/equipment cost	9.5%

4.0 DETAILED COST ESTIMATES BY TRADE DIVISION FOR EACH CENTRE

NOTE Items which have been affected by the new 1990 Alberta Building Code are identified in the detailed estimates by displaying these items in **bold** print.

DETAILED COST ESTIMATES FOR CALGARY

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
1.	EXCAVATION & BACKFILL								
1.1	Excavate for basement, wall footings, bases.	891	m3	0.55	490	1.15	1,025	1.70	1,515
1.2	Backfill to basement walls, footings, and bases.	188	m3	0.75	141	3.00	564	3.75	705
1.3	Remove surplus excavated material from site.	703	m3	0.00	0	4.25	2,988	4.25	2,988
	TOTAL - EXCAVATION & BACKFILL	2.80 /m2 GFA			631		4,577		5,208
2.	CONCRETE & GRAVEL								
2.1.0	Cribbing, including placing rebar and pouring concrete in footings (560 x 250 mm).	222	m	6.25	1,388	1.50	333	7.75	1,721
2.1.1	Cribbing, including placing rebar and pouring concrete in basement walls (1.2 m high)	96	m	15.00	1,440	6.00	576	21.00	2,016
2.1	SUB-TOTAL - CRIBBING	2.01 /m2 GFA			2,828		909		3,737
2.2	Reinforcing steel in footings and basement walls (material only).	1,652	kg	0.00	0	0.72	1,189	0.72	1,189
2.3	25 MPa concrete in 250 x 560 mm reinforced footings and bases (material only).	32	m3	0.00	0	98.00	3,136	98.00	3,136

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CALGARY
CONSTRUCTION COST ESTIMATE
GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
2.4	25 MPa concrete in 200 mm reinforced basement wall (material only).	26	m3	0.00	0	98.00	2,548	98.00	2,548
2.5	100 mm perforated plastic weeping tile in crushed gravel surround.	96	m	2.70	259	3.50	336	6.20	595
2.6	Two coats asphaltic emulsion on concrete walls.	159	m2	0.90	143	0.90	143	1.80	286
2.7	150 mm clean washed gravel under slab-on-grade.	70	m3	3.50	245	26.00	1,820	29.50	2,065
2.8	4 mil polyethylene vapor barrier on gravel or sand bed.	501	m2	0.30	150	0.28	140	0.58	290
2.9	6x6 WWM in slab-on-grade (material only).	456	m2	0.00	0	2.25	1,026	2.25	1,026
2.10	90 mm concrete (20 MPa) in slab on grade.	456	m2	5.50	2,508	8.20	3,739	13.70	6,247
2.11	38 mm thick rigid insulation to concrete wall (basement).	117	m2	2.75	322	5.50	644	8.26	966
2.12	Concrete ramp for handicap access	1	No.	900.00	900	1,500.00	1,500	2,400.00	2,400
TOTAL - CONCRETE & GRAVEL		13.19 /m2 GFA			7,355	17,130		24,485	

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CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
3.	ROUGH CARPENTRY								
3.1.0	Framing Material (#2 SPF or better)								
	- floor joists - truss joists @ 400 c/c	3,900	m	0.00	0	3.25	12,675	3.25	12,675
	- built-up beam (3 - 38 x 235 mm)	800	m	0.00	0	2.85	2,280	2.85	2,280
	- built-up beam (2 - 38 x 235 mm)	340	m	0.00	0	2.85	969	2.85	969
	- roof joists - truss joists @ 400 c/c	1,400	m	0.00	0	3.25	4,550	3.25	4,550
	- framing (38 x 140 mm)	4,550	m	0.00	0	1.25	5,688	1.25	5,688
	- plate (38 x 140 mm)	1,240	m	0.00	0	1.25	1,550	1.25	1,550
	- cross bridging (38 x 38 mm)	790	m	0.00	0	0.69	545	0.69	545
	- framing (38 x 89 mm)	10,000	m	0.00	0	0.80	8,000	0.80	8,000
	- blocking (38 x 89 mm)	1,450	m	0.00	0	0.80	1,160	0.80	1,160
	- blocking (38 x 140 mm)	120	m	0.00	0	1.25	150	1.25	150
	- wall strapping (38 x 38 mm)	320	m	0.00	0	0.65	208	0.65	208
	- fascia board (19 x 140 mm)	110	m	0.00	0	0.78	86	0.78	86
3.1.1	Material only - sheathing								
	- 19 mm plywood (floor underlay) 1432m2	490	shts	0.00	0	21.50	10,535	21.50	10,535
	- 13 mm tentest (u/s of joist) 1368m2	464	shts	0.00	0	9.00	4,176	9.00	4,176
	- 10 mm plywood (roof sheathing) 524m2	180	shts	0.00	0	10.00	1,800	10.00	1,800
	- 13 mm plywood (wall sheathing 19m2 protection board 350 mm high)	7	shts	0.00	0	14.00	98	14.00	98
	- 8 mm plywood (wall sheathing) 727m2	260	shts	0.00	0	8.50	2,210	8.50	2,210
3.1	SUB-TOTAL - FRAMING MATERIALS	30.52 /m2 GFA			0		56,680		56,680

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CALGARY
CONSTRUCTION COST ESTIMATE
GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
3.2	90 x 238 mm wide batt insulation (R12) at vertical eaves.	99	m	0.60	59	0.80	79	1.39	138
3.3	Stair - 6 flights @ (2 x 6 x 8 = 96 risers).								
	- 38 x 300 mm stringers	59	m	5.00	295	3.25	192	8.25	487
	- 38 x 235 mm treads	103	m	5.00	515	2.80	288	7.80	803
	- 6.4 mmx 275 mm fir plywood in risers	115	m	5.00	575	1.15	132	6.15	707
3.4	Labour only - complete framing including trusses and window installation.	1,857	m2	22.00	40,854	0.00	0	22.00	40,854
TOTAL - ROUGH CARPENTRY		53.67 /m2 GFA			42,298		57,371		99,669
4.	ROOFING								
4.1	Built-up asphalt roofing complete with granular finish and flashing.	527	m2	10.00	5,270	15.00	7,905	25.00	13,175
4.2	Batt insulation (R34) in joist space.	527	m2	1.00	527	5.80	3,057	6.80	3,584
4.3	6 mil polyethylene vapour barrier.	580	m2	0.30	174	0.44	255	0.74	429
4.4	Prefinished flashing over window.	66	m	1.80	119	3.60	238	5.41	357
TOTAL - ROOFING		9.45 /m2 GFA			6,090		11,455		17,545

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
5.	WINDOWS & DOORS								
5.1.0	Double-glazed wired glass sealed window in steel frame (size 2.4 x 2.5 m).	4	No.	0.00	0	1,075.00	4,300	1,075.00	4,300
5.1.1	Double-glazed sliding units in wood frame incl. PVC sliders, screen and hardware.								
	- size 2.4 m x 0.9 m	6	No.	0.00	0	280.00	1,680	280.00	1,680
	- size 1.5 m x 0.9 m	28	No.	0.00	0	210.00	5,880	210.00	5,880
	- size 0.9 m x 0.9 m	3	No.	0.00	0	166.00	498	166.00	498
5.1	<i>SUB-TOTAL - WINDOWS</i>	6.65	/m2 GFA		0		12,358		12,358
5.2.0	Double-glazed patio door in wood frame with aluminum cladding, including hardware (size 2.4 m x 1.8 m).	18	No.	0.00	0	770.00	13,860	770.00	13,860
5.2.1	Aluminum entrance and sidelite (size 2.4 m x 2.1 m) incl. 0.9 m x 2.1 m alum glazed door c/w closer, push and pull, lock and aluminum threshold.	2	No.	0.00	0	1,450.00	2,900	1,450.00	2,900
5.2	<i>SUB-TOTAL - EXTERIOR DOORS & SCREENS</i>	9.03	/m2 GFA		0		16,760		16,760
	TOTAL - WINDOWS & DOORS	15.68	/m2 GFA		0		29,118		29,118

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NOVEMBER 1992

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CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
6.	EXTERIOR CLADDING								
6.1	Prefinished aluminum siding.	98	m2	6.00	588	15.00	1,470	21.00	2,058
6.2	Stained dark-brown cedar siding 25 x 150 mm channel to column.	425	m	0.65	276	1.40	595	2.05	871
6.3	Stucco on wire mesh incl. building paper.	678	m	12.50	8,475	6.20	4,204	18.70	12,679
6.4	24 ga. aluminum vented soffit c/w edge moulding.	59	m2	5.00	295	10.60	625	15.59	920
6.5	Parging to concrete walls.	29	m2	11.50	334	4.00	116	15.52	450
TOTAL - EXTERIOR CLADDING		9.14 /m2 GFA			9,968		7,010		16,978
7.	PLUMBING								
7.1	Complete plumbing rough-in & finishing including roof drains	24	apt.	500.00	12,000	575.00	13,800	1,075.00	25,800
7.2	Complete plumbing fixtures including: - 22 No. w.c. and 2 handicap w.c. - 22 No. baths and 2 handicap showers - 32 No. lavatory basins - special handicap fixtures (2 sets) - 1 No. mop service sink - 1 No. laundry tub - 1 water heater and storage tank	24	apt.	450.00	10,800	1,425.00	34,200	1,875.00	45,000
TOTAL - PLUMBING		38.13 /m2 GFA			22,800		48,000		70,800

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CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
8.	<i>ELECTRICAL</i>								
8.1	Complete electrical installation, including supply of fixtures, and including: - 400A main supply - 60A electrical panels to apartments - duplex receptacles, switches - TV and telephone wiring and outlets	24	apt.	800.00	19,200	1,275.00	30,600	2,075.00	49,800
8.2	Fire alarm system, including smoke detectors.	24	apt.	80.00	1,920	95.00	2,280	175.00	4,200
<i>TOTAL - ELECTRICAL</i>		29.08 /m2 GFA		21,120		32,880		54,000	
9.	<i>HEATING</i>								
9.1	Gas-fired, hot water circulation system (268 m total length) c/w boiler, piping radiators, 24 control valves, centrifugal pump, and 50 Imp. gal. expansion tank.	24	apt.	700.00	16,800	1,200.00	28,800	1,900.00	45,600
<i>TOTAL - HEATING</i>		24.56 /m2 GFA		16,800		28,800		45,600	
10.	<i>VENTILATION</i>								
10.1	Ventilation system, complete for building including all ductwork and fans.	24	apt.	500.00	12,000	725.00	17,400	1,225.00	29,400
<i>TOTAL - VENTILATION</i>		15.83 /m2 GFA		12,000		17,400		29,400	

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24 UNIT WALK-UP APARTMENT
CALGARY
CONSTRUCTION COST ESTIMATE
GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
11.	<i>FIRE PROTECTION</i>								
11.1	Fire protection system, complete for building.	24	apt.	60.00	1,440	65.00	1,560	125.00	3,000
	<i>TOTAL - FIRE PROTECTION</i>	1.62	/m2 GFA		1,440		1,560		3,000
12.	<i>SPECIALTY ITEMS</i>								
12.1	Drapery tracks.	102	m	4.00	408	7.75	791	11.75	1,199
12.2.0	1060 mm high metal balustrade to balconies c/w balusters @ 100 mm o.c.	98	m	32.50	3,185	20.00	1,960	52.50	5,145
12.2.1	Metal balustrade to stairs c/w vinyl cap.	66	m	30.00	1,980	22.00	1,452	52.00	3,432
12.2.2	50mm dia. pipe handrail and brackets.	54	m	14.50	783	10.40	562	24.91	1,345
12.2	<i>SUB-TOTAL - METAL BALUSTRADE & HANDRAIL</i>	5.34	/m2 GFA		5,948		3,974		9,922
	<i>TOTAL - SPECIALTY ITEMS</i>	5.99	/m2 GFA		6,356		4,765		11,121

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24 UNIT WALK-UP APARTMENT

CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
13.	<i>DRYWALL, INSULATION & CAULKING</i>								
13.1	Gypsum wallboard (13 mm standard) on walls, taped and sanded.	3,906	m2	3.20	12,499	2.50	9,765	5.70	22,264
13.2	Gypsum wallboard (13 mm fire rated). - walls 705m2 - stair soffit 29m2	734	m2	3.20	2,349	2.90	2,129	6.10	4,478
13.3	Gypsum wallboard (16 mm), taped and sanded..	487	m2	3.20	1,558	3.00	1,461	6.20	3,019
13.4	Gypsum wallboard (16 mm fire rated) to shaft enclosure, taped and sanded..	63	m2	4.20	265	3.00	189	7.21	454
13.5	Gypsum wallboard (19 mm) to shaft enclosure core.	63	m2	5.00	315	5.00	315	10.00	630
13.6	Gypsum wallboard (16 mm fire rated with sound barrier) on ceiling, taped and sanded.	1,887	m2	3.00	5,661	3.10	5,850	6.10	11,511
13.7	Gypsum wallboard (2 layers, 16 mm fire rated with sound batts) on ceiling, taped and sanded.	4	m2	5.10	20	5.85	23	10.75	43
13.8	Tentest board, Crane 3-183 Redcliffe.	524	m2	1.30	681	2.85	1,493	4.15	2,174

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24 UNIT WALK-UP APARTMENT

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CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
13.9	Textured finish to ceiling.	1,425	m2	0.90	1,283	0.75	1,069	1.65	2,352
13.10	6 mil polyethylene vapor barrier.	1,346	m2	0.30	404	0.44	592	0.74	996
13.11	Batt insulation (R20) to exterior walls.	728	m2	0.90	655	3.90	2,839	4.80	3,494
13.12	Batt insulation (R20) to interior walls.	908	m2	0.90	817	3.90	3,541	4.80	4,358
13.13	Caulking to exterior doors, windows, junction of siding and concrete.	725	m	0.40	290	0.30	218	0.70	508
13.14	Interior caulking to tubs and showers.	227	m	0.85	193	0.40	91	1.25	284
TOTAL - DRYWALL, INSULATION, CAULKING		30.46 /m2 GFA			26,990		29,575		56,565
14.	CABINETS & VANITIES								
14.1.0	Vanities and base cabinets - supply only.	96	m	0.00	0	230.00	22,080	230.00	22,080
14.1.1	Kitchen wall cabinets - supply only.	99	m	0.00	0	165.00	16,335	165.00	16,335
14.1.2	Countertops - supply only.	96	m	0.00	0	65.00	6,240	65.00	6,240
14.1	SUB-TOTAL - CABINETRY SUPPLY	24.05 /m2 GFA			0		44,655		44,655

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CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
14.2	Installation labour.	24	apt.	200.00	4,800	0.00	0	200.00	4,800
TOTAL - CABINETS & VANITIES		26.63 /m2 GFA			4,800		44,655		49,455
15. INTERIOR FINISHING									
15.1.0	Interior - Alum. entrance and sidelite (size 2.4 m x 2.1 m) incl. 0.9 x 2.1 m aluminum glazed door c/w closer, push and pull, lock and aluminum threshold.	1	No.	0.00	0	1,450.00	1,450	1,450.00	1,450
15.1.1	Rated door and sidelite with 0.9 m x 2.1 m, 20 min. labelled wood door, pressed steel frame incl. hardware and 6mm wired glass to sidelite.								
	- 1.9 x 2.1 m	4	No.	0.00	0	1,260.00	5,040	1,260.00	5,040
	- 1.4 x 2.1 m	4	No.	0.00	0	1,180.00	4,720	1,180.00	4,720
15.1.2	Solid core door and frame, ribbon cut mahogany.								
	- 0.9 m x 2.1 m x 44 mm (20 min. label)	24	No.	0.00	0	180.00	4,320	180.00	4,320
	- 0.85 m x 2.1 m x 44 mm	26	No.	0.00	0	180.00	4,680	180.00	4,680
	- 0.9 m x 2.1 m x 44 mm (45 min. label)	1	No.	0.00	0	195.00	195	195.00	195
15.1.3	Hollow core door and frame, ribbon cut								

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CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
	mahogany.								
	- 0.70 m x 2.0 m x 35 mm	24	No.	0.00	0	44.00	1,056	44.00	1,056
	- 0.75 m x 2.0 m x 35 mm	24	No.	0.00	0	44.00	1,056	44.00	1,056
15.1.4	Metal door (1 hr. label) c/w fire rated pressed steel frame.								
	- 0.90 m x 2.1 m x 45 mm	1	No.	0.00	0	441.00	441	441.00	441
15.1.5	Bi-fold doors c/w hardware.								
	- 1.8 m x 2.0 m	28	No.	0.00	0	96.00	2,688	96.00	2,688
	- 1.5 m x 2.0 m	14	No.	0.00	0	86.00	1,204	86.00	1,204
	- 1.2 m x 2.0 m	6	No.	0.00	0	80.00	480	80.00	480
	- 0.9 m x 2.0 m	14	No.	0.00	0	48.00	672	48.00	672
	- 0.6 m x 2.0 m	16	No.	0.00	0	40.00	640	40.00	640
15.1	SUB-TOTAL - INTERIOR DOORS	15.42	/m2 GFA		0		28,642		28,642
15.2	Select grade fir in window and door trim and base (40 x 12 mm).								
	- windows 431m	3,314	m	0.00	0	1.10	3,645	1.10	3,645
	- doors 555m								
	- base 2328m								

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m²

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
15.3.0	Lock sets to interior doors.	23	sets	0.00	0	27.00	621	27.00	621
15.3.1	Latch sets.	75	sets	0.00	0	15.00	1,125	15.00	1,125
15.3.2	Bathroom privacy latch sets.	22	sets	0.00	0	17.00	374	17.00	374
15.3.3	Lever sets (handicap suites).	8	sets	0.00	0	45.00	360	45.00	360
15.3.4	Door closers (rated).	14	No.	0.00	0	60.00	840	60.00	840
14.3	<i>SUB-TOTAL - DOOR HARDWARE</i>	1.79	/m2 GFA		0		3,320		3,320
15.4.0	Washroom accessories. - 24 No. toilet tissue holders - 24 No. soap dishes - 48 No. towel bars	96	No.	0.00	0	7.50	720	7.50	720
15.4.1	Grab bars	6	No.	0.00	0	75.00	450	75.00	450
15.4.2	Medicine cabinets.	24	No.	0.00	0	70.00	1,680	70.00	1,680
15.4.3	25mm chrome shower curtain rods.	24	No.	0.00	0	6.00	144	6.00	144
15.4.4	18mm chrome coat rods.	24	No.	0.00	0	5.00	120	5.00	120
15.4	<i>SUB-TOTAL - WASHROOM ACCESSORIES</i>	1.68	/m2 GFA		0		3,114		3,114
15.5	Mail box and apartment numbers (size 810 x 450 mm) for 24 apartments.	1	set	0.00	0	450.00	450	450.00	450

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
15.6	Shelving - Douglas fir plywood, lipped one edge (450 mm wide x 20 mm thick)..	107	m	0.00	0	10.50	1,124	10.50	1,124
15.7	Finishing labour.	24	apt.	530.00	12,720	0.00	0	530.00	12,720
TOTAL - INTERIOR FINISHING		28.55 /m2 GFA			12,720		40,295		53,015
16.	PAINTING, STAIN & LACQUER								
16.1.0	Interior work - prepare, one coat primer sealer, one coat latex or semigloss on gypsum wallboard. - walls 4962m2 - ceiling 234m2	5,196	m2	1.90	9,872	0.75	3,897	2.65	13,769
16.1.1	Two coats urethane varnish on doors, frames. latex or semigloss paint to drywall, etc.	105	No.	30.00	3,150	6.50	683	36.50	3,833
16.1.2	Prepare, prime, one coat semigloss on base, door and window casing.	2,328	m	0.95	2,212	0.20	466	1.15	2,678
16.1.3	Prepare, prime, one coat semigloss on shelving.	94	m2	2.70	254	0.68	64	3.38	318
16.1	SUB-TOTAL - INTERIOR PAINTING	11.09 /m2 GFA			15,488		5,110		20,598

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
16.2.0	Prepare, prime, two coats enamel on fascia board to balconies and entrance canopy.	26	m2	3.60	94	2.50	65	6.12	159
16.2.1	Prepare, prime, two coats enamel on metal handrail and balustrade.	783	m	2.00	1,566	0.60	470	2.60	2,036
16.2	<i>SUB-TOTAL - EXTERIOR PAINTING</i>	1.18	/m2 GFA		1,660		535		2,195
	<i>TOTAL - PAINTING, STAIN & LACQUER</i>	12.27	/m2 GFA		17,148		5,645		22,793
17.	<i>FLOOR COVERINGS</i>								
17.1	32 oz, 100% nylon carpet with 13mm chip foam underlay.	1,296	m2	4.25	5,508	19.00	24,624	23.25	30,132
17.2	Sheet vinyl flooring 2.5 mm thick with adhesive to sub-floor.	364	m2	6.00	2,184	9.50	3,458	15.50	5,642
17.3	Gypcrete floor topping including steel trowel finish.	1,338	m2	6.75	9,032	3.45	4,616	10.20	13,648
17.4	'Neoprene Hypalon' waterproofing or equal to balcony.	67	m2	17.00	1,139	22.00	1,474	39.00	2,613
	<i>TOTAL - FLOOR COVERINGS</i>	28.02	/m2 GFA		17,863		34,172		52,035

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
18.	CERAMIC TILE								
18.1	Ceramic tile 100 x 100 x 6 mm tile with thinset on drywall.	137	m2	26.00	3,562	19.00	2,603	45.00	6,165
TOTAL - CERAMIC TILE		3.32 /m2 GFA			3,562		2,603		6,165
19.	APPLIANCES								
19.1	Freestanding range, 760 mm (30") high, four surface elements, oven auto timer.	24	No.	20.00	480	510.00	12,240	530.00	12,720
19.2	Refrigerator, frost free, 0.42 m3 (15 cu.ft.) capacity.	24	No.	20.00	480	605.00	14,520	625.00	15,000
19.3	Coin operated dryer.	2	No.	20.00	40	625.00	1,250	645.00	1,290
19.4	Coin operated washer.	2	No.	20.00	40	865.00	1,730	885.00	1,770
19.5	Range hood.	24	No.	20.00	480	75.00	1,800	95.00	2,280
TOTAL - APPLIANCES		17.80 /m2 GFA			1,520		31,540		33,060

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
20.	SITE OVERHEAD								
20.1	Mobilization.	24	apt.	0.00	0	250.00	6,000	250.00	6,000
20.2	Supervision.	24	apt.	1,000.00	24,000	0.00	0	1,000.00	24,000
20.3	Survey.	24	apt.	70.00	1,680	0.00	0	70.00	1,680
20.4	Site office.	24	apt.	0.00	0	65.00	1,560	65.00	1,560
20.5	Rentals.	24	apt.	0.00	0	125.00	3,000	125.00	3,000
20.6	Small tools.	24	apt.	0.00	0	65.00	1,560	65.00	1,560
20.7	Security.	24	apt.	100.00	2,400	0.00	0	100.00	2,400
20.8	Hoarding.	24	apt.	0.00	0	50.00	1,200	50.00	1,200
20.9	Garbage removal.	24	apt.	0.00	0	85.00	2,040	85.00	2,040
20.10	Cleaning.	24	apt.	250.00	6,000	0.00	0	250.00	6,000
TOTAL - SITE OVERHEAD		26.62 /m2 GFA			34,080	15,360		49,440	

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

CALGARY

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
21.	GENERAL CONTRACTOR'S OVERHEAD & PROFIT								
21.1	Permits.	24	apt.	0.00	0	190.00	4,560	190.00	4,560
21.2	Bonding and insurance.	24	apt.	0.00	0	215.00	5,160	215.00	5,160
21.3	Office overhead.	24	apt.	425.00	10,200	90.00	2,160	515.00	12,360
21.4	Profit.	24	apt.	350.00	8,400	550.00	13,200	900.00	21,600
TOTAL - GENERAL CONTRACTOR'S OVERHEAD & PROFIT		23.52 /m2 GFA		18,600		25,080		43,680	
SUBTOTAL - CALGARY		416.33 /m2 GFA		284,141		488,991		773,132	
GOODS & SERVICES TAX		29.14 /m2 GFA		19,890		34,229		54,119	
TOTAL - CALGARY		445.48 /m2 GFA		304,031		523,220		827,251	

DETAILED COST ESTIMATES FOR EDMONTON

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
1.	EXCAVATION & BACKFILL								
1.1	Excavate for basement, wall footings, bases.	891	m3	0.60	535	1.10	980	1.70	1,515
1.2	Backfill to basement walls, footings, and bases.	188	m3	0.75	141	3.50	658	4.25	799
1.3	Remove surplus excavated material from site.	703	m3	0.00	0	4.00	2,812	4.00	2,812
	TOTAL - EXCAVATION & BACKFILL	2.76 /m2 GFA			676		4,450		5,126
2.	CONCRETE & GRAVEL								
2.1.0	Cribbing, including placing rebar and pouring concrete in footings (560 x 250 mm).	222	m	6.50	1,443	1.50	333	8.00	1,776
2.1.1	Cribbing, including placing rebar and pouring concrete in basement walls (1.2 m high)	96	m	15.00	1,440	8.00	768	23.00	2,208
2.1	SUB-TOTAL - CRIBBING	2.15 /m2 GFA			2,883		1,101		3,984
2.2	Reinforcing steel in footings and basement walls (material only).	1,652	kg	0.00	0	0.75	1,239	0.75	1,239
2.3	25 MPa concrete in 250 x 560 mm reinforced footings and bases (material only).	32	m3	0.00	0	106.00	3,392	106.00	3,392

1992 ALBERTA HOUSE COST COMPARISON STUDY
NOVEMBER 1992
24 UNIT WALK-UP APARTMENT
EDMONTON
CONSTRUCTION COST ESTIMATE
GROSS FLOOR AREA: 1857 m2

Item		Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
2.4		25 MPa concrete in 200 mm reinforced basement wall (material only).	26	m3	0.00	0	106.00	2,756	106.00	2,756
2.5		100 mm perforated plastic weeping tile in crushed gravel surround.	96	m	2.90	278	3.40	326	6.29	604
2.6		Two coats asphaltic emulsion on concrete walls.	159	m2	0.90	143	0.90	143	1.80	286
2.7		150 mm clean washed gravel under slab-on-grade.	70	m3	4.00	280	24.00	1,680	28.00	1,960
2.8		4 mil polyethylene vapor barrier on gravel or sand bed.	501	m2	0.30	150	0.28	140	0.58	290
2.9		6x6 WWM in slab-on-grade (material only).	456	m2	0.00	0	2.30	1,049	2.30	1,049
2.10		90 mm concrete (20 MPa) in slab on grade.	456	m2	7.25	3,306	9.00	4,104	16.25	7,410
2.11		38 mm thick rigid insulation to concrete wall (basement).	117	m2	2.80	328	5.40	632	8.21	960
2.12		Concrete ramp for handicap access	1	No.	800.00	850	1,700.00	1,700	2,550.00	2,550
TOTAL - CONCRETE & GRAVEL			14.26 /m2 GFA		8,218		18,262		26,480	

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost	
3.	ROUGH CARPENTRY									
3.1.0	Framing Material (#2 SPF or better)									
	- floor joists - truss joists @ 400 c/c	3,900	m	0.00	0	3.25	12,675	3.25	12,675	
	- built-up beam (3 - 38 x 235 mm)	800	m	0.00	0	2.80	2,240	2.80	2,240	
	- built-up beam (2 - 38 x 235 mm)	340	m	0.00	0	2.80	952	2.80	952	
	- roof joists - truss joists @ 400 c/c	1,400	m	0.00	0	3.25	4,550	3.25	4,550	
	- framing (38 x 140 mm)	4,550	m	0.00	0	1.25	5,688	1.25	5,688	
	- plate (38 x 140 mm)	1,240	m	0.00	0	1.25	1,550	1.25	1,550	
	- cross bridging (38 x 38 mm)	790	m	0.00	0	0.65	514	0.65	514	
	- framing (38 x 89 mm)	10,000	m	0.00	0	0.85	8,500	0.85	8,500	
	- blocking (38 x 89 mm)	1,450	m	0.00	0	0.85	1,233	0.85	1,233	
	- blocking (38 x 140 mm)	120	m	0.00	0	1.25	150	1.25	150	
	- wall strapping (38 x 38 mm)	320	m	0.00	0	0.65	208	0.65	208	
	- fascia board (19 x 140 mm)	110	m	0.00	0	0.72	79	0.72	79	
3.1.1	Material only - sheathing									
	- 19 mm plywood (floor underlay)	1432m2	490	shts	0.00	0	19.50	9,555	19.50	9,555
	- 13 mm tentest (u/s of joist)	1368m2	464	shts	0.00	0	9.00	4,176	9.00	4,176
	- 10 mm plywood (roof sheathing)	524m2	180	shts	0.00	0	10.50	1,890	10.50	1,890
	- 13 mm plywood (wall sheathing	19m2	7	shts	0.00	0	13.50	95	13.57	95
	protection board 350 mm high)									
	- 8 mm plywood (wall sheathing)	727m2	260	shts	0.00	0	9.50	2,470	9.50	2,470
3.1	SUB-TOTAL - FRAMING MATERIALS	30.44	/m2 GFA		0		56,525		56,525	

1992 ALBERTA HOUSE COST COMPARISON STUDY
NOVEMBER 1992
24 UNIT WALK-UP APARTMENT
EDMONTON
CONSTRUCTION COST ESTIMATE
GROSS FLOOR AREA: 1857 m2

Item		Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
3.2		90 x 238 mm wide batt insulation (R12) at vertical eaves.	99	m	0.60	59	0.80	79	1.39	138
3.3		Stair - 6 flights @ (2 x 6 x 8 = 96 risers).								
		- 38 x 300 mm stringers	59	m	5.00	295	3.20	189	8.20	484
		- 38 x 235 mm treads	103	m	5.00	515	2.80	288	7.80	803
		- 6.4 mmx 275 mm fir plywood in risers	115	m	5.00	575	1.15	132	6.15	707
3.4		Labour only - complete framing including trusses and window installation.	1,857	m2	22.50	41,783	0.00	0	22.50	41,783
TOTAL - ROUGH CARPENTRY			54.09 /m2 GFA		43,227		57,213		100,440	
4.	ROOFING									
4.1		Built-up asphalt roofing complete with granular finish and flashing.	527	m2	11.00	5,797	14.00	7,378	25.00	13,175
4.2		Batt insulation (R34) in joist space.	527	m2	1.00	527	5.85	3,083	6.85	3,610
4.3		6 mil polyethylene vapour barrier.	580	m2	0.30	174	0.44	255	0.74	429
4.4		Prefinished flashing over window.	66	m	1.90	125	3.50	231	5.39	356
TOTAL - ROOFING			9.46 /m2 GFA		6,623		10,947		17,570	

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
5.	WINDOWS & DOORS								
5.1.0	Double-glazed wired glass sealed window in steel frame (size 2.4 x 2.5 m).	4	No.	0.00	0	1,200.00	4,800	1,200.00	4,800
5.1.1	Double-glazed sliding units in wood frame incl. PVC sliders, screen and hardware.								
	- size 2.4 m x 0.9 m	6	No.	0.00	0	310.00	1,860	310.00	1,860
	- size 1.5 m x 0.9 m	28	No.	0.00	0	225.00	6,300	225.00	6,300
	- size 0.9 m x 0.9 m	3	No.	0.00	0	170.00	510	170.00	510
5.1	SUB-TOTAL - WINDOWS	7.25	/m2 GFA		0		13,470		13,470
5.2.0	Double-glazed patio door in wood frame with aluminum cladding, including hardware (size 2.4 m x 1.8 m).	18	No.	0.00	0	850.00	15,300	850.00	15,300
5.2.1	Aluminum entrance and sidelite (size 2.4 m x 2.1 m) incl. 0.9 m x 2.1 m alum glazed door c/w closer, push and pull, lock and aluminum threshold.	2	No.	0.00	0	1,550.00	3,100	1,550.00	3,100
5.2	SUB-TOTAL - EXTERIOR DOORS & SCREENS	9.91	/m2 GFA		0		18,400		18,400
	TOTAL - WINDOWS & DOORS	17.16	/m2 GFA		0		31,870		31,870

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
6.	EXTERIOR CLADDING								
6.1	Prefinished aluminum siding.	98	m2	5.80	568	16.00	1,568	21.80	2,136
6.2	Stained dark-brown cedar siding 25 x 150 mm channel to column.	425	m	0.60	255	1.40	595	2.00	850
6.3	Stucco on wire mesh incl. building paper.	678	m	12.60	8,543	6.15	4,170	18.75	12,713
6.4	24 ga. aluminum vented soffit c/w edge moulding.	59	m2	5.00	295	10.00	590	15.00	885
6.5	Parging to concrete walls.	29	m2	11.50	334	4.50	131	16.03	465
TOTAL - EXTERIOR CLADDING		9.18 /m2 GFA		9,995		7,054		17,049	
7.	PLUMBING								
7.1	Complete plumbing rough-in & finishing including roof drains	24	apt.	525.00	12,600	575.00	13,800	1,100.00	26,400
7.2	Complete plumbing fixtures including: - 22 No. w.c. and 2 handicap w.c. - 22 No. baths and 2 handicap showers - 32 No. lavatory basins - special handicap fixtures (2 sets) - 1 No. mop service sink - 1 No. laundry tub - 1 water heater and storage tank	24	apt.	525.00	12,600	1,450.00	34,800	1,975.00	47,400
TOTAL - PLUMBING		39.74 /m2 GFA		25,200		48,600		73,800	

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
8.	<i>ELECTRICAL</i>								
8.1	Complete electrical installation, including supply of fixtures, and including: - 400A main supply - 60A electrical panels to apartments - duplex receptacles, switches - TV and telephone wiring and outlets	24	apt.	800.00	19,200	1,350.00	32,400	2,150.00	51,600
8.2	Fire alarm system, including smoke detectors.	24	apt.	75.00	1,800	90.00	2,160	165.00	3,960
<i>TOTAL - ELECTRICAL</i>		29.92 /m2 GFA		21,000		34,560		55,560	
9.	<i>HEATING</i>								
9.1	Gas-fired, hot water circulation system (268 m total length) c/w boiler, piping radiators, 24 control valves, centrifugal pump, and 50 Imp. gal. expansion tank.	24	apt.	650.00	15,600	1,300.00	31,200	1,950.00	46,800
<i>TOTAL - HEATING</i>		25.20 /m2 GFA		15,600		31,200		46,800	
10.	<i>VENTILATION</i>								
10.1	Ventilation system, complete for building including all ductwork and fans.	24	apt.	500.00	12,000	725.00	17,400	1,225.00	29,400
<i>TOTAL - VENTILATION</i>		15.83 /m2 GFA		12,000		17,400		29,400	

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
11.	FIRE PROTECTION								
11.1	Fire protection system, complete for building.	24	apt.	60.00	1,440	70.00	1,680	130.00	3,120
	TOTAL - FIRE PROTECTION	1.68	/m2 GFA		1,440		1,680		3,120
12.	SPECIALTY ITEMS								
12.1	Drapery tracks.	102	m	4.00	408	7.60	775	11.60	1,183
12.2.0	1060 mm high metal balustrade to balconies c/w balusters @ 100 mm o.c.	98	m	33.00	3,234	22.00	2,156	55.00	5,390
12.2.1	Metal balustrade to stairs c/w vinyl cap.	66	m	28.00	1,848	23.00	1,518	51.00	3,366
12.2.2	50mm dia. pipe handrail and brackets.	54	m	14.00	756	10.50	567	24.50	1,323
12.2	SUB-TOTAL - METAL BALUSTRADE & HANDRAIL	5.43	/m2 GFA		5,838		4,241		10,079
	TOTAL - SPECIALTY ITEMS	6.06	/m2 GFA		6,246		5,016		11,262

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
13.	<i>DRYWALL, INSULATION & CAULKING</i>								
13.1	Gypsum wallboard (13 mm standard) on walls, taped and sanded.	3,906	m2	3.30	12,890	2.50	9,765	5.80	22,655
13.2	Gypsum wallboard (13 mm fire rated). - walls - stair soffit	734	m2	3.30	2,422	2.90	2,129	6.20	4,551
		705m2							
		29m2							
13.3	Gypsum wallboard (16 mm), taped and sanded..	487	m2	3.30	1,607	3.00	1,461	6.30	3,068
13.4	Gypsum wallboard (16 mm fire rated) to shaft enclosure, taped and sanded..	63	m2	4.40	277	3.00	189	7.40	466
13.5	Gypsum wallboard (19 mm) to shaft enclosure core.	63	m2	5.30	334	5.00	315	10.30	649
13.6	Gypsum wallboard (16 mm fire rated with sound barrier) on ceiling, taped and sanded.	1,887	m2	3.10	5,850	3.10	5,850	6.20	11,700
13.7	Gypsum wallboard (2 layers, 16 mm fire rated with sound batts) on ceiling, taped and sanded.	4	m2	5.00	20	5.90	24	11.00	44
13.8	Tentest board, Crane 3-183 Redcliffe.	524	m2	1.40	734	2.90	1,520	4.30	2,254

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
13.9	Textured finish to ceiling.	1,425	m2	0.90	1,283	0.75	1,069	1.65	2,352
13.10	6 mil polyethylene vapor barrier.	1,346	m2	0.30	404	0.44	592	0.74	996
13.11	Batt insulation (R20) to exterior walls.	728	m2	0.95	692	3.85	2,803	4.80	3,495
13.12	Batt insulation (R20) to interior walls.	908	m2	0.95	863	3.85	3,496	4.80	4,359
13.13	Caulking to exterior doors, windows, junction of siding and concrete.	725	m	0.45	326	0.30	218	0.75	544
13.14	Interior caulking to tubs and showers.	227	m	0.85	193	0.40	91	1.25	284
TOTAL - DRYWALL, INSULATION, CAULKING		30.92 /m2 GFA			27,895		29,522		57,417
14. CABINETS & VANITIES									
14.1.0	Vanities and base cabinets - supply only.	96	m	0.00	0	225.00	21,600	225.00	21,600
14.1.1	Kitchen wall cabinets - supply only.	99	m	0.00	0	160.00	15,840	160.00	15,840
14.1.2	Countertops - supply only.	96	m	0.00	0	70.00	6,720	70.00	6,720
14.1 SUB-TOTAL - CABINETRY SUPPLY		23.78 /m2 GFA			0		44,160		44,160

1992 ALBERTA HOUSE COST COMPARISON STUDY
NOVEMBER 1992
24 UNIT WALK-UP APARTMENT
EDMONTON
CONSTRUCTION COST ESTIMATE
GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
14.2	Installation labour.	24	apt.	210.00	5,040	0.00	0	210.00	5,040
TOTAL - CABINETS & VANITIES		26.49 /m2 GFA		5,040		44,160		49,200	
15.	INTERIOR FINISHING								
15.1.0	Interior - Alum. entrance and sidelite (size 2.4 m x 2.1 m) incl. 0.9 x 2.1 m aluminum glazed door c/w closer, push and pull, lock and aluminum threshold.	1	No.	0.00	0	1,550.00	1,550	1,550.00	1,550
15.1.1	Rated door and sidelite with 0.9 m x 2.1 m, 20 min. labelled wood door, pressed steel frame incl. hardware and 6mm wired glass to sidelite.								
	- 1.9 x 2.1 m	4	No.	0.00	0	1,275.00	5,100	1,275.00	5,100
	- 1.4 x 2.1 m	4	No.	0.00	0	1,200.00	4,800	1,200.00	4,800
15.1.2	Solid core door and frame, ribbon cut mahogany.								
	- 0.9 m x 2.1 m x 44 mm (20 min. label)	24	No.	0.00	0	180.00	4,320	180.00	4,320
	- 0.85 m x 2.1 m x 44 mm	26	No.	0.00	0	180.00	4,680	180.00	4,680
	- 0.9 m x 2.1 m x 44 mm (45 min. label)	1	No.	0.00	0	195.00	195	195.00	195
15.1.3	Hollow core door and frame, ribbon cut								

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
	mahogany.								
	- 0.70 m x 2.0 m x 35 mm	24	No.	0.00	0	42.00	1,008	42.00	1,008
	- 0.75 m x 2.0 m x 35 mm	24	No.	0.00	0	42.00	1,008	42.00	1,008
15.1.4	Metal door (1 hr. label) c/w fire rated pressed steel frame.								
	- 0.90 m x 2.1 m x 45 mm	1	No.	0.00	0	420.00	420	420.00	420
15.1.5	Bi-fold doors c/w hardware.								
	- 1.8 m x 2.0 m	28	No.	0.00	0	96.00	2,688	96.00	2,688
	- 1.5 m x 2.0 m	14	No.	0.00	0	86.00	1,204	86.00	1,204
	- 1.2 m x 2.0 m	6	No.	0.00	0	80.00	480	80.00	480
	- 0.9 m x 2.0 m	14	No.	0.00	0	48.00	672	48.00	672
	- 0.6 m x 2.0 m	16	No.	0.00	0	40.00	640	40.00	640
15.1	SUB-TOTAL - INTERIOR DOORS	15.49	/m2 GFA		0		28,765		28,765
15.2	Select grade fir in window and door trim and base (40 x 12 mm).								
	- windows 431m	3,314	m	0.00	0	1.20	3,977	1.20	3,977
	- doors 555m								
	- base 2328m								

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
15.3.0	Lock sets to interior doors.	25	sets	0.00	0	26.00	650	26.00	650
15.3.1	Latch sets.	81	sets	0.00	0	15.00	1,215	15.00	1,215
15.3.2	Bathroom privacy latch sets.	24	sets	0.00	0	17.00	408	17.00	408
15.3.3	Lever sets (handicap suites).	8	sets	0.00	0	45.00	360	45.00	360
15.3.4	Door closers (rated).	14	No.	0.00	0	63.00	882	63.00	882
14.3	<i>SUB-TOTAL - DOOR HARDWARE</i>	1.89	/m2 GFA		0		3,515		3,515
15.4.0	Washroom accessories. - 24 No. toilet tissue holders - 24 No. soap dishes - 48 No. towel bars	96	No.	0.00	0	7.50	720	7.50	720
15.4.1	Grab bars	6	No.	0.00	0	75.00	450	75.00	450
15.4.2	Medicine cabinets.	24	No.	0.00	0	75.00	1,800	75.00	1,800
15.4.3	25mm chrome shower curtain rods.	24	No.	0.00	0	6.00	144	6.00	144
15.4.4	18mm chrome coat rods.	24	No.	0.00	0	5.00	120	5.00	120
15.4	<i>SUB-TOTAL - WASHROOM ACCESSORIES</i>	1.74	/m2 GFA		0		3,234		3,234
15.5	Mail box and apartment numbers (size 810 x 450 mm) for 24 apartments.	1	set	0.00	0	450.00	450	450.00	450

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
15.6	Shelving - Douglas fir plywood, lipped one edge (450 mm wide x 20 mm thick)..	107	m	0.00	0	11.00	1,177	11.00	1,177
15.7	Finishing labour.	24	apt.	525.00	12,600	0.00	0	525.00	12,600
TOTAL - INTERIOR FINISHING		28.93 /m2 GFA			12,600		41,118		53,718
16.	PAINTING, STAIN & LACQUER								
16.1.0	Interior work - prepare, one coat primer sealer, one coat latex or semigloss on gypsum wallboard. - walls 4962m2 - ceiling 234m2	5,196	m2	1.80	9,353	0.75	3,897	2.55	13,250
16.1.1	Two coats urethane varnish on doors, frames. latex or semigloss paint to drywall, etc.	105	No.	28.00	2,940	7.00	735	35.00	3,675
16.1.2	Prepare, prime, one coat semigloss on base, door and window casing.	2,328	m	0.90	2,095	0.25	582	1.15	2,677
16.1.3	Prepare, prime, one coat semigloss on shelving.	94	m2	2.50	235	0.70	66	3.20	301
16.1	SUB-TOTAL - INTERIOR PAINTING	10.72 /m2 GFA			14,623		5,280		19,903

1992 ALBERTA HOUSE COST COMPARISON STUDY							NOVEMBER 1992		
24 UNIT WALK-UP APARTMENT				EDMONTON					
CONSTRUCTION COST ESTIMATE				GROSS FLOOR AREA: 1857 m2					
Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
16.2.0	Prepare, prime, two coats enamel on fascia board to balconies and entrance canopy.	26	m2	3.50	91	2.40	62	5.88	153
16.2.1	Prepare, prime, two coats enamel on metal handrail and balustrade.	783	m	2.00	1,566	0.60	470	2.60	2,036
16.2	SUB-TOTAL - EXTERIOR PAINTING	1.18 /m2 GFA			1,657		532		2,189
TOTAL - PAINTING, STAIN & LACQUER		11.90 /m2 GFA			16,280		5,812		22,092
17.	FLOOR COVERINGS								
17.1	32 oz, 100% nylon carpet with 13mm chip foam underlay.	1,296	m2	4.50	5,832	19.50	25,272	24.00	31,104
17.2	Sheet vinyl flooring 2.5 mm thick with adhesive to sub-floor.	364	m2	6.00	2,184	10.00	3,640	16.00	5,824
17.3	Gypcrete floor topping including steel trowel finish.	1,338	m2	6.50	8,697	3.35	4,482	9.85	13,179
17.4	'Neoprene Hypalon' waterproofing or equal to balcony.	67	m2	16.50	1,106	22.00	1,474	38.51	2,580
TOTAL - FLOOR COVERINGS		28.37 /m2 GFA			17,819		34,868		52,687

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
18.	CERAMIC TILE								
18.1	Ceramic tile 100 x 100 x 6 mm tile with thinset on drywall.	137	m2	25.00	3,425	20.00	2,740	45.00	6,165
TOTAL - CERAMIC TILE		3.32 /m2 GFA			3,425		2,740		6,165
19.	APPLIANCES								
19.1	Freestanding range, 760 mm (30") high, four surface elements, oven auto timer.	24	No.	20.00	480	530.00	12,720	550.00	13,200
19.2	Refrigerator, frost free, 0.42 m3 (15 cu.ft.) capacity.	24	No.	20.00	480	625.00	15,000	645.00	15,480
19.3	Coin operated dryer.	2	No.	20.00	40	650.00	1,300	670.00	1,340
19.4	Coin operated washer.	2	No.	20.00	40	900.00	1,800	920.00	1,840
19.5	Range hood.	24	No.	20.00	480	75.00	1,800	95.00	2,280
TOTAL - APPLIANCES		18.38 /m2 GFA			1,520		32,620		34,140

1992 ALBERTA HOUSE COST COMPARISON STUDY								NOVEMBER 1992	
24 UNIT WALK-UP APARTMENT				EDMONTON					
CONSTRUCTION COST ESTIMATE				GROSS FLOOR AREA: 1857 m2					
Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
20.	SITE OVERHEAD								
20.1	Mobilization.	24	apt.	0.00	0	250.00	6,000	250.00	6,000
20.2	Supervision.	24	apt.	1,050.00	25,200	0.00	0	1,050.00	25,200
20.3	Survey.	24	apt.	65.00	1,560	0.00	0	65.00	1,560
20.4	Site office.	24	apt.	0.00	0	70.00	1,680	70.00	1,680
20.5	Rentals.	24	apt.	0.00	0	125.00	3,000	125.00	3,000
20.6	Small tools.	24	apt.	0.00	0	65.00	1,560	65.00	1,560
20.7	Security.	24	apt.	100.00	2,400	0.00	0	100.00	2,400
20.8	Hoarding.	24	apt.	0.00	0	50.00	1,200	50.00	1,200
20.9	Garbage removal.	24	apt.	0.00	0	85.00	2,040	85.00	2,040
20.10	Cleaning.	24	apt.	300.00	7,200	0.00	0	300.00	7,200
TOTAL - SITE OVERHEAD		27.92 /m2 GFA			36,360		15,480		51,840

1992 ALBERTA HOUSE COST COMPARISON STUDY

NOVEMBER 1992

24 UNIT WALK-UP APARTMENT

EDMONTON

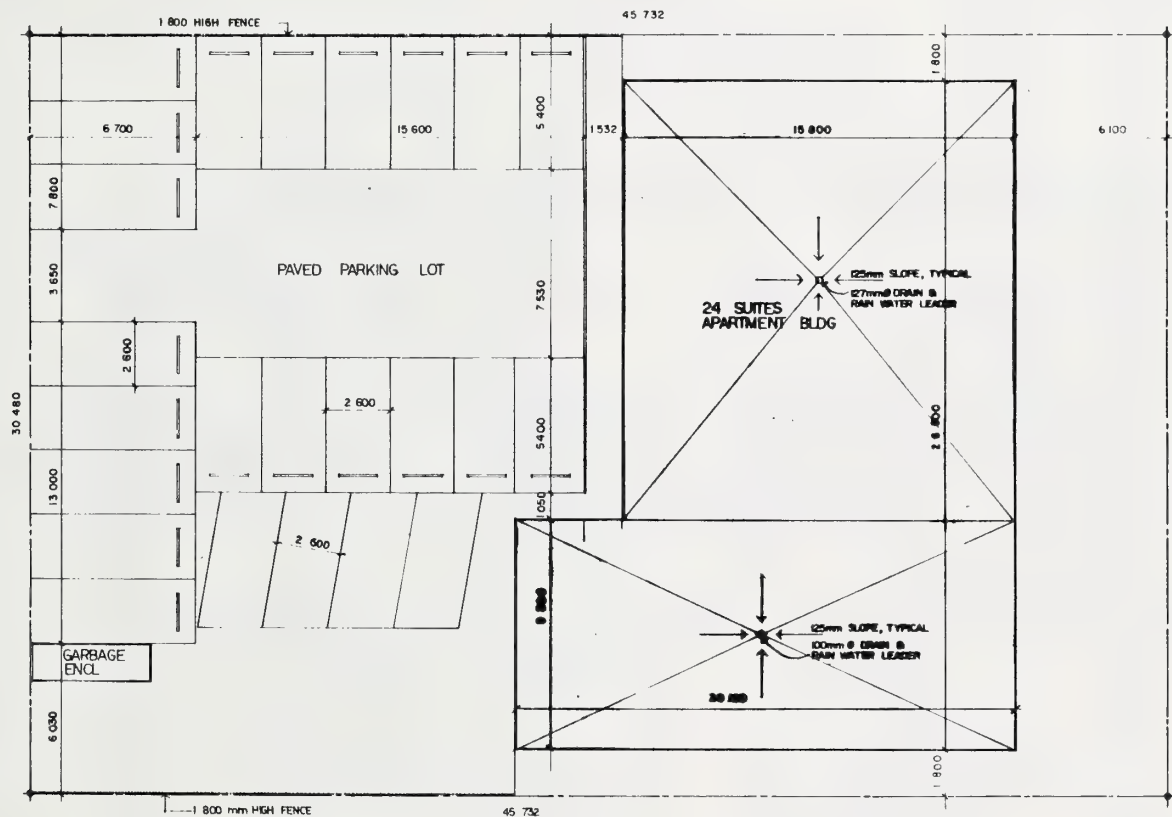
CONSTRUCTION COST ESTIMATE

GROSS FLOOR AREA: 1857 m2

Item	Description	Quantity	Unit	Labour Unit Rate	Labour Item Cost	Mat/Equip Unit Rate	Mat/Equip Item Cost	Total Unit Rate	Total Cost
21.	GENERAL CONTRACTOR'S OVERHEAD & PROFIT								
21.1	Permits.	24	apt.	0.00	0	190.00	4,560	190.00	4,560
21.2	Bonding and insurance.	24	apt.	0.00	0	215.00	5,160	215.00	5,160
21.3	Office overhead.	24	apt.	430.00	10,320	80.00	1,920	510.00	12,240
21.4	Profit.	24	apt.	350.00	8,400	500.00	12,000	850.00	20,400
TOTAL - GENERAL CONTRACTOR'S OVERHEAD & PROFIT		22.81 /m2 GFA			18,720		23,640		42,360
SUBTOTAL - EDMONTON		424.39 /m2 GFA			289,884		498,212		788,096
GOODS & SERVICES TAX		29.71 /m2 GFA			20,292		34,875		55,167
TOTAL - EDMONTON		454.10 /m2 GFA			310,176		533,087		843,263

APPENDIX

REDUCED DRAWINGS - 24 UNIT WALK-UP APARTMENT



STATISTICS

SITE AREA 1394m²
 SUITES 24 (101 BEDROOM)
 BUILDING AREA 465m²
 PARKING 24 CARS

THE BUILDING IS REQUIRED TO FACE AT LEAST ONE STREET.

ACCESS WALL PANELS -OR- WINDOW SHALL BE PROVIDED ON SECOND AND THIRD FLOOR IN AT LEAST 1 WALL FACING ON A STREET.

SPECIAL SEPARATIONS BETWEEN BUILDINGS

THE MAXIMUM PERCENTAGE OF UNPROTECTED OPENINGS IN AN EXPOSED BUILDING FACE SHALL CONFORM TO THE REQUIREMENTS OUTLINED IN THE ALBERTA BUILDING CODE (19.10.14.)

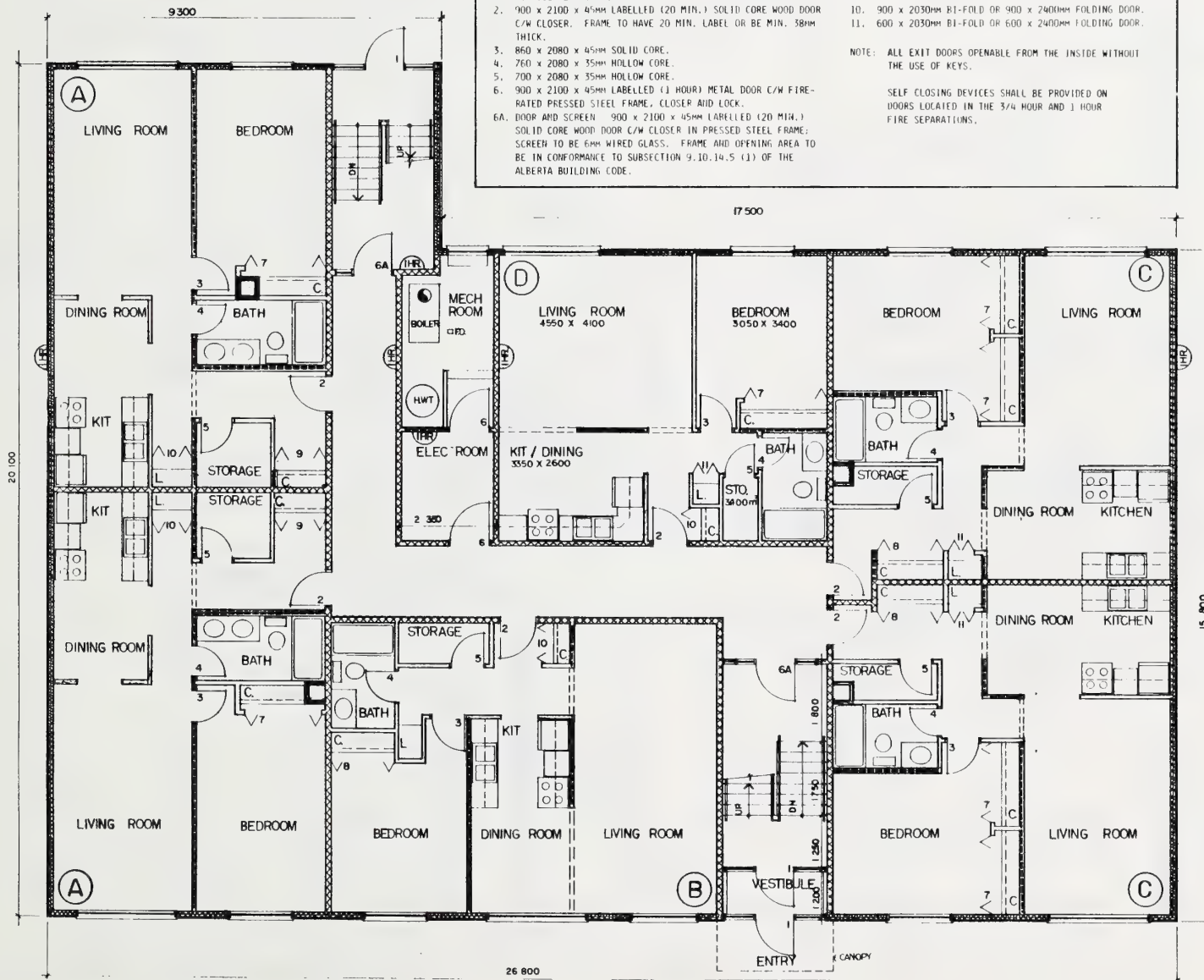
ONE SET OF EXAMINED DRAWINGS SHALL BE AVAILABLE CONTINUOUSLY AT THE CONSTRUCTION SITE DURING WORKING HOURS FOR INSPECTION BY THE AUTHORITY HAVING JURISDICTION.

ALBERTA HOUSE COST COMPARISON STUDY

SITE PLAN

SCALE 1:100





DOOR SCHEDULE

1. 900 x 2100mm ALUMINUM GLAZED DOOR C/W DOOR CLOSER, PUSH AND PULL, LOCK AND THRESHOLD. (NOTE FROM INSIDE SHOULD NOT USE KEY TO OPEN).
2. 900 x 2100 x 45mm LABELLED (20 MIN.) SOLID CORE WOOD DOOR C/W CLOSER. FRAME TO HAVE 20 MIN. LABEL OR BE MIN. 38mm THICK.
3. 860 x 2080 x 45mm SOLID CORE.
4. 760 x 2080 x 35mm HOLLOW CORE.
5. 700 x 2080 x 35mm HOLLOW CORE.
6. 900 x 2100 x 45mm LABELLED (1 HOUR) METAL DOOR C/W FIRE-RATED PRESSED STEEL FRAME, CLOSER AND LOCK.
- 6A. DOOR AND SCREEN 900 x 2100 x 45mm LABELLED (20 MIN.) SOLID CORE WOOD DOOR C/W CLOSER IN PRESSED STEEL FRAME; SCREEN TO BE 6mm WIRED GLASS. FRAME AND OPENING AREA TO BE IN CONFORMANCE TO SUBSECTION 9.10.14.5 (1) OF THE ALBERTA BUILDING CODE.

7. 1800 x 2080mm BI-FOLD OR 1800 x 2400mm FOLDING DOOR.
8. 1500 x 2080mm BI-FOLD OR 1800 x 2400mm FOLDING DOOR.
9. 1200 x 2080mm BI-FOLD OR 1200 x 2400mm FOLDING DOOR.
10. 900 x 2030mm BI-FOLD OR 900 x 2400mm FOLDING DOOR.
11. 600 x 2030mm BI-FOLD OR 600 x 2400mm FOLDING DOOR.

NOTE: ALL EXIT DOORS OPENABLE FROM THE INSIDE WITHOUT THE USE OF KEYS.

SELF CLOSING DEVICES SHALL BE PROVIDED ON DOORS LOCATED IN THE 3/4 HOUR AND 1 HOUR FIRE SEPARATIONS.

WALL LEGEND

- EXTERIOR STUD WALL:** C/W 38 x 38mm STRAPPING TO FOUNDATION WALL. SIDING OR STUCCO, BUILDING PAPER, 38 x 140mm STUDS @ 400mm O.C., RSI 2.1 MINERAL WOOL INSULATION, VAPOUR BARRIER, 12.7mm GYPSUM BOARD.
- EXTERIOR STUD WALL:** 1 HOUR FIRE RESISTANCE RATING. C/W 38 x 38mm STRAPPING TO FOUNDATION WALL. NON-COMBUSTIBLE SIDING OR STUCCO, BUILDING PAPER, 38 x 140mm STUDS @ 400mm O.C., RSI 3.5 MINERAL WOOL INSULATION WITH DENSITY OF 1.2kg/m³, VAPOUR BARRIER, 15.9mm TYPE X GYPSUM BOARD.
- EXTERIOR STUD WALL:** SIDING OR STUCCO, BUILDING PAPER, 38 x 89mm STUDS @ 400mm O.C., RSI 2.1 MINERAL WOOL INSULATION, VAPOUR BARRIER, 12.7mm GYPSUM BOARD.
- EXTERIOR STUD WALL:** 1 HOUR FIRE RESISTANCE RATING. NON-COMBUSTIBLE SIDING OR STUCCO, BUILDING PAPER, 38 x 89mm STUDS @ 400mm O.C., RSI 2.1 MINERAL WOOL INSULATION WITH DENSITY OF 1.2kg/m³, VAPOUR BARRIER, 15.9mm TYPE X GYPSUM BOARD.
- INTERIOR WALL (3/4 HOUR FIRE SEPARATION):** 2 ROWS OF 38 x 89mm STUDS, EACH SET 400mm O.C. STAGGERED ON COMMON 38 x 140mm PLATE, MINERAL FIBRE WITH A MASS OF AT LEAST 1.2kg/m² ON EACH SIDE; 12.7mm GYPSUM BOARD, BOTH SIDES.
- INTERIOR WALL:** 12.7mm GYPSUM BOARD BOTH SIDES OF 38 x 140mm STUDS.
- INTERIOR WALL:** (3/4 HOUR FIRE RESISTANCE RATING) 38 x 89mm STUDS @ 400mm O.C. (BASEMENT - 38 x 140mm STUDS) AND 12.7mm TYPE X GYPSUM BOARD, BOTH SIDES.
- INTERIOR WALL:** (1 HOUR FIRE SEPARATION) 2 ROWS OF 38 x 89mm STUDS, EACH SET 400mm O.C. STAGGERED ON COMMON 38 x 140mm PLATE, MINERAL FIBRE ON EACH SIDE, 15.9mm TYPE X GYPSUM BOARD, BOTH SIDES.
- INTERIOR WALL:** (1 HOUR FIRE SEPARATION) 38 x 140mm STUDS @ 400mm O.C. AND 15.9mm TYPE X GYPSUM BOARD BOTH SIDES.
- INTERIOR WALL:** 38 x 89mm STUDS AT 400mm O.C. AND 12.7mm GYPSUM BOARD, BOTH SIDES.
- DRIP BEAM**
- NOTES**
 - DOUBLE STUDS UNDER ALL BEARING POINTS AND ALL OPENINGS.
 - LINTELS: 2 - 38 x 235mm BUILT-UP LINTEL, HORIZONTALLY ABOVE ALL OPENINGS.
 - BALCONY CANTILEVERED JOISTS SHALL EXTEND INTO BUILDING MINIMUM 2400mm.
- SHAFT ENCLOSURE:** 3/4 FIRE RESISTANCE RATING AND STC OF 45, 15.9mm TYPE X GYPSUM BOARD, 57mm x .530mm THICK GALVANIZED STEEL I-STUDS AT 400mm O.C. AND J-TRACKS TOP AND BOTTOM, RESILIENT FURRING CHANNELS @ 600mm O.C., MINERAL WOOL INSULATION WITH DENSITY OF 1.2kg/m³, 19mm GYPSUM CORE BOARD.

ALBERTA HOUSE COST COMPARISON STUDY

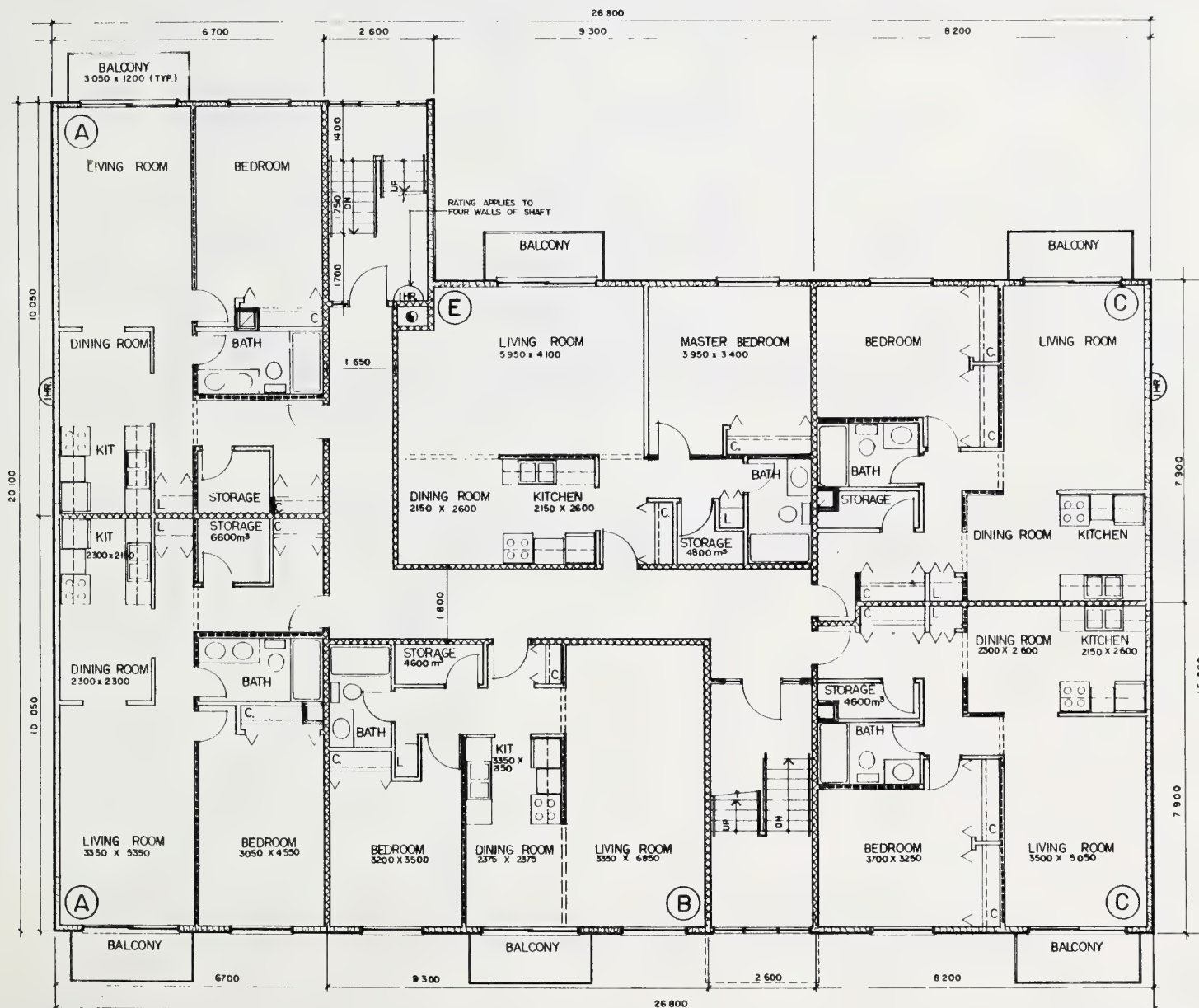
BASEMENT FLOOR PLAN

SCALE 1" = 50'



NOTE
SEE BASEMENT FLOOR PLAN
FOR TYPICAL DOOR & BI-FOLD
DOOR TYPES, SIZES & LOCATIONS



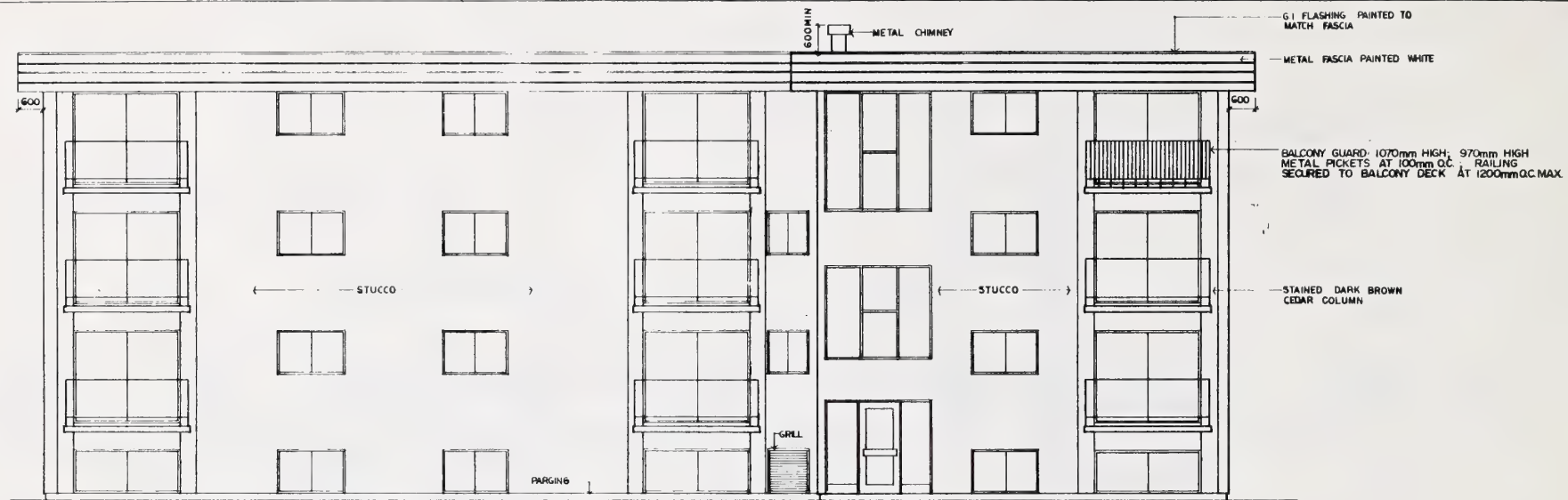


ALBERTA HOUSE COST COMPARISON STUDY

2ND & 3RD FLOOR PLAN

SCALE 1:50





REAR ELEVATION



LEFT ELEVATION

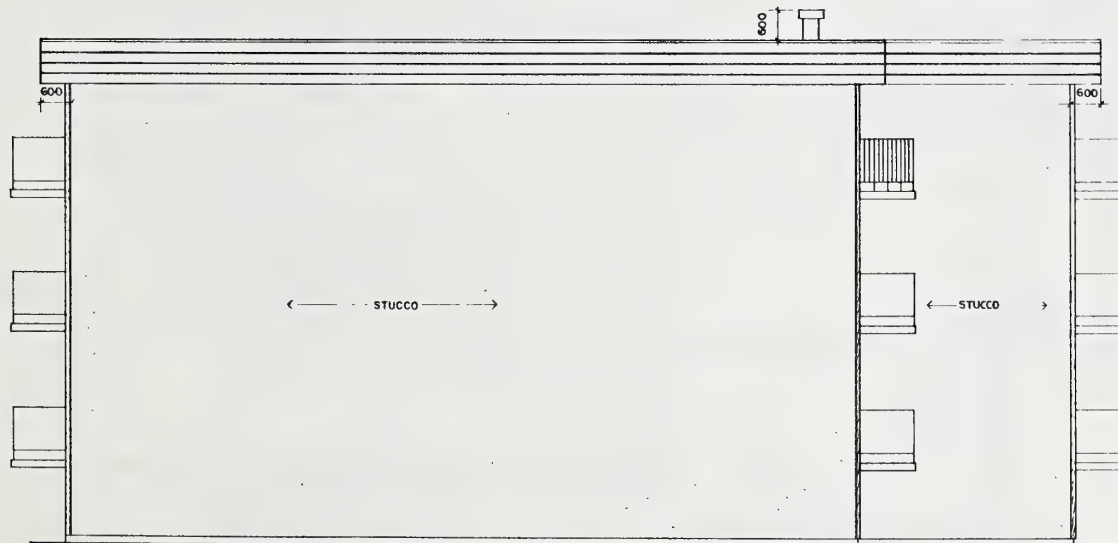
DRAWINGS SHALL BE SIGNED AND SEALED BY A
PROFESSIONAL ENGINEER OR ARCHITECT REGISTERED
IN THE PROVINCE OF ALBERTA.

ALBERTA HOUSE COST COMPARISON STUDY
ELEVATIONS
SCALE 1:50





FRONT ELEVATION



RIGHT ELEVATION

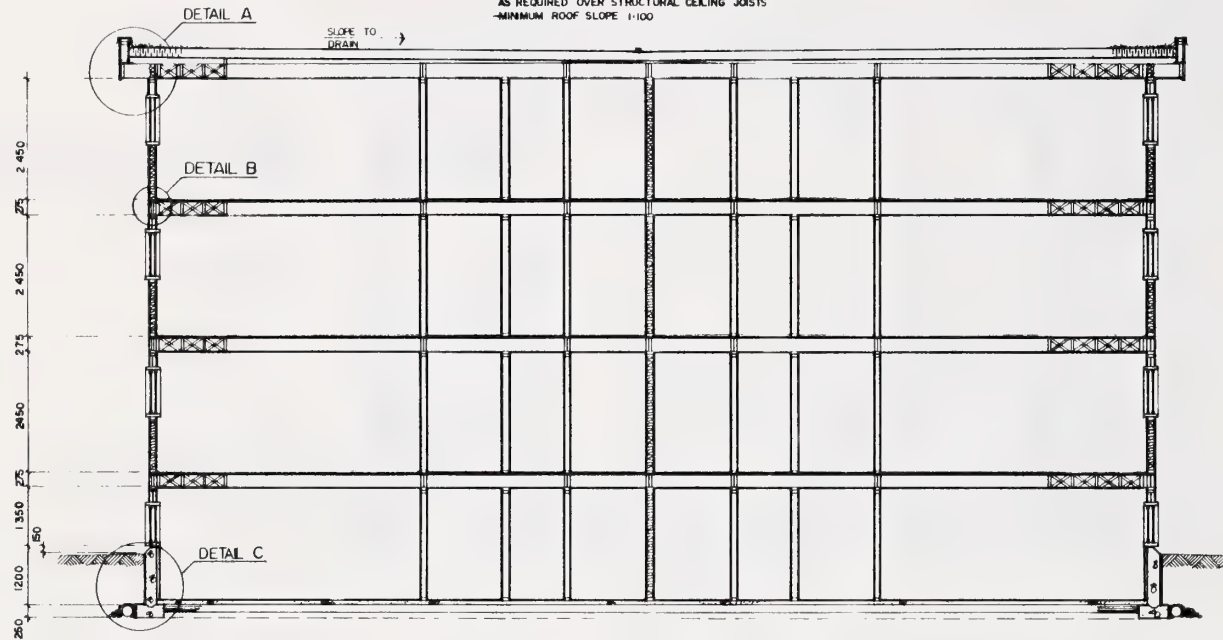
ALBERTA HOUSE COST COMPARISON STUDY

ELEVATIONS

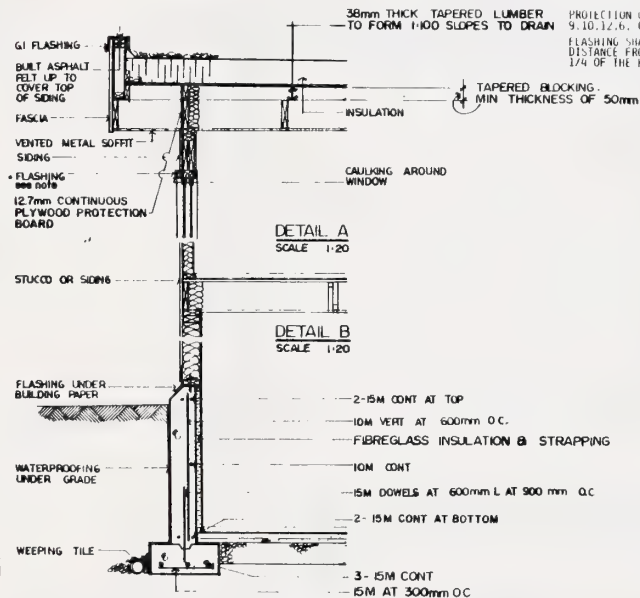
SCALE 1:50



NOTE - SEE SITE PLAN FOR ROOF SLOPE CONFIGURATION
 - ACHIEVE SLOPES BY TAPERING 38mm THICK LUMBER
 AS REQUIRED OVER STRUCTURAL CEILING JOISTS
 - MINIMUM ROOF SLOPE 1:100



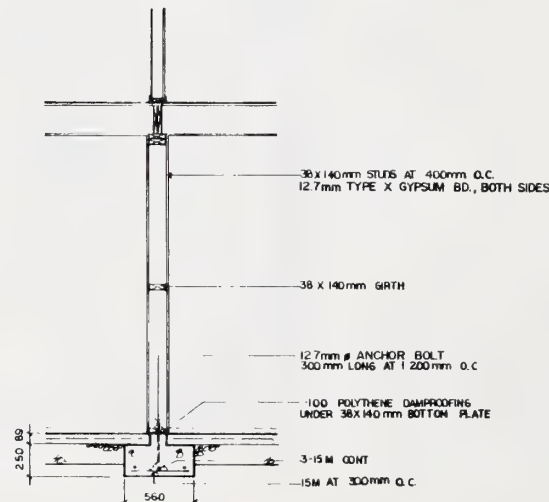
SECTION
 SCALE 1:50



DETAIL A
 SCALE 1:20

DETAIL B
 SCALE 1:20

DETAIL C
 SCALE 1:20



TYPICAL INTERIOR FOOTING
 SCALE 1:20

ROOF CONSTRUCTION - 1 HOUR FIRE RESISTANCE RATING

- ROOFING GRAVEL
- BUILT-UP ROOFING
- RSI 6 RIGID FIBREGLASS INSULATION AND VAPOUR BARRIER
- 10mm PLYWOOD SHEATHING: ALL EDGES SUPPORTED WITH MIN. 38 x 38mm WOOD BLOCKING
- 38 x 235mm NO. 1 SPRUCE JOISTS AT 400mm O.C.
- 38 x 38mm CROSS-BRIDGING

- 15.9mm TYPE X GYPSUM BOARD

EXTERIOR WALL CONSTRUCTION

TYPE A: 1/2 HOUR FIRE RESISTANCE RATING

- SIDING OR STUCCO
- BUILDING PAPER
- RSI 2.1 MINERAL WOOL INSULATION AND VAPOUR BARRIER
- 38 x 89mm WOOD STUDS @ 400mm O.C. (38 x 140mm WOOD STUDS @ 400mm O.C. FOR BASEMENT)
- 12.7mm GYPSUM BOARD

TYPE B: 1 HOUR FIRE RESISTANCE RATING

- SAME AS TYPE A EXCEPT MINERAL WOOL INSULATION TO HAVE DENSITY OF 1.2kg/m³, 15.9mm TYPE X GYPSUM BOARD AND STUCCO OR NON-COMBUSTIBLE SIDING

FLOOR CONSTRUCTION

- 3/4 HOUR FIRE SEPARATION AND S.T.C. RATING OF 45
- FLOOR FINISH
- 8mm PLYWOOD UNDERLAY
- 19mm T & G LUMBER OR 15.9mm PLYWOOD OR WATERBOARD
- SUBFLOOR WITH MINERAL FIBRE BETWEEN JOISTS SPACED 400mm O.C.
- 38 x 235mm NO. 1 SPRUCE JOISTS AT 400mm O.C.
- 38 x 38mm CROSS-BRIDGING AT 2.1m O.C. MAX.
- RESILIENT CHANNELS
- 15.9mm TYPE X GYPSUM BOARD TYPICALLY EXCEPT FOR MECHANICAL ROOM CEILING; APPLY 2 LAYERS OF 15.9mm TYPE X GYPSUM BOARD

CORRIDOR AND DEMISING WALL CONSTRUCTION

- 3/4 HOUR FIRE SEPARATION AND S.T.C. RATING OF 45
- TWO ROWS 38 x 89mm STUDS, EACH SET 400mm O.C. STAGGERED OR COMMON 38 x 140mm PLATE, MINERAL FIBRE WITH A MASS OF AT LEAST 1.2kg/m³ ON EACH SIDE
- 12.7mm GYPSUM BOARD, BOTH SIDES.

BLANKING WALL CONSTRUCTION

- 3/4 HOUR FIRE RESISTANCE RATING
- 38 x 140mm OR 38 x 89mm WOOD STUDS @ 400mm O.C.
- 12.7mm TYPE X GYPSUM WALLBOARD, BOTH SIDES

NOTES

1. PROVIDE GALVANIZED STEEL, GA. .457mm AT THE HEAD OF ALL EXTERIOR OPENINGS.
2. WEeping TILES SHALL BE LAID ON UNDISTURBED OR WELL-COMPACTED SOIL SO THAT THE TOP OF THE WEeping TILE IS BELOW THE UNDERSIDE OF THE FLOOR SLAB.
3. ROOF TRUSSES SHALL BE DESIGNED IN CONFORMANCE WITH PART 4 AND FOR THE APPROPRIATE GROUND SNOW LOADS STATED IN TABLE 2.2.1.8. (STANDARDS B5-D1-008)

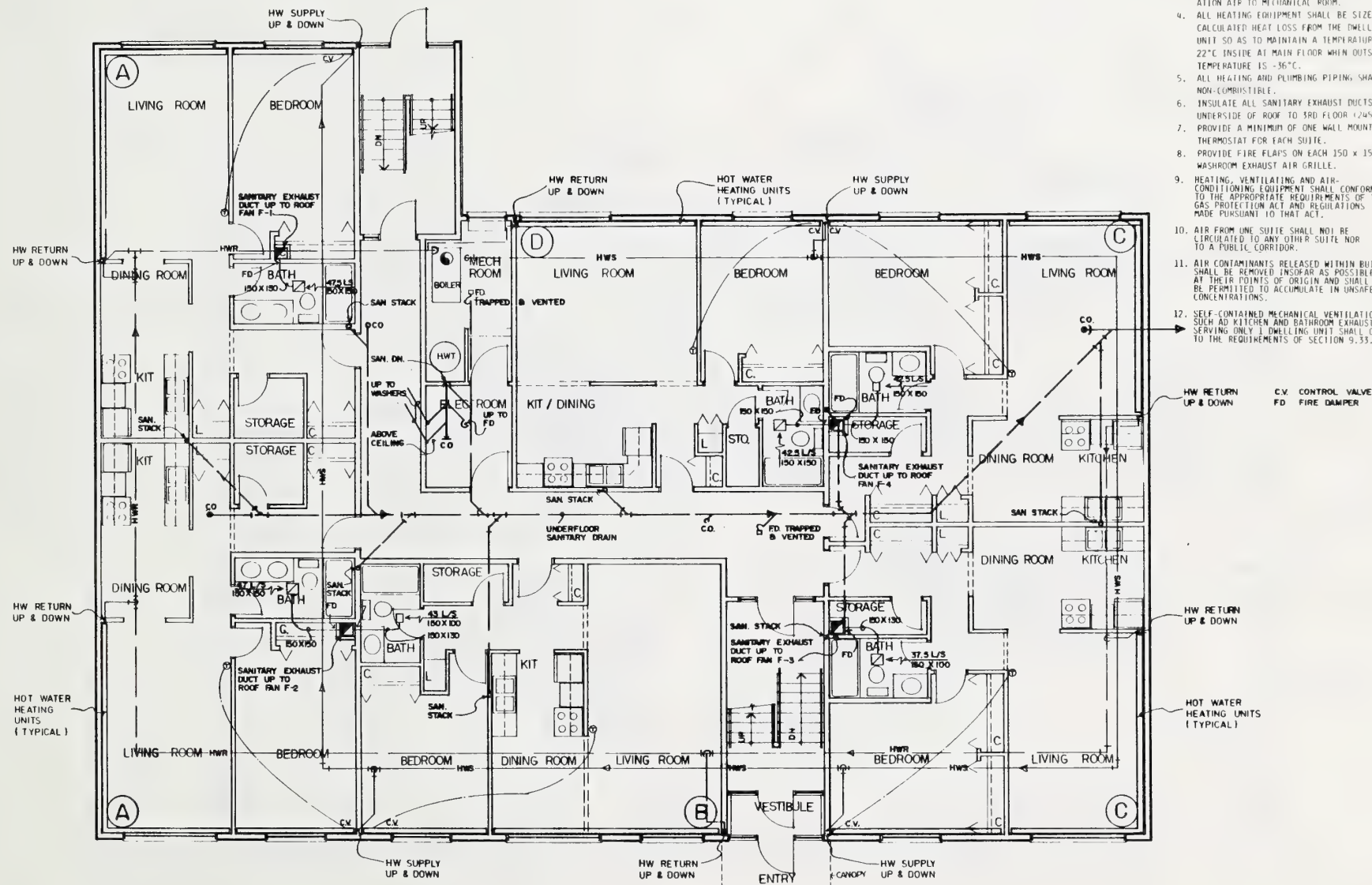
NOTE
 ALTERNATE INSULATION
 RSI 6 FIBREGLASS BATT
 INSULATION SET IN
 JOIST SPACE

ALBERTA HOUSE COST COMPARISON STUDY

SECTION & DETAILS

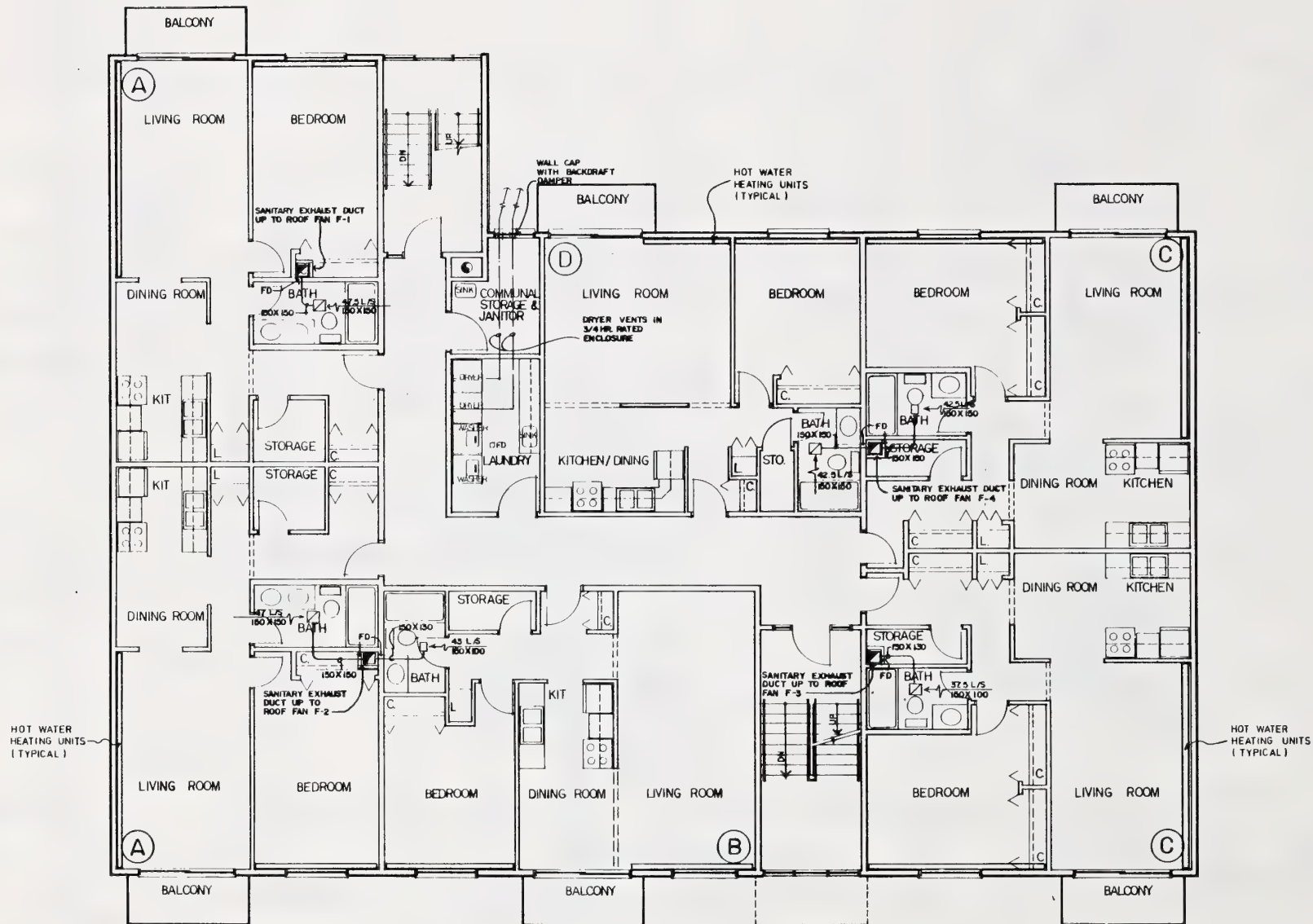
SCALES: AS SHOWN

1. GAS FIRED HOT WATER HEATING BOILER SHALL BE INSTALLED IN ACCORDANCE WITH "THE GAS PROTECTION ACT AND REGULATIONS MADE PURSUANT TO THE ACT".
2. PROVIDE TYPE "B" CHEMISTRY FOR BOILER
3. PROVIDE ADEQUATE COMBUSTION AND VENTILATION AIR TO MECHANICAL ROOM.
4. ALL HEATING EQUIPMENT SHALL BE SIZED ON A CALCULATED HEAT LOSS FROM THE DWELLING UNIT SO AS TO MAINTAIN A TEMPERATURE OF 22°C INSIDE AT MAIN FLOOR WHEN OUTSIDE TEMPERATURE IS -36°C.
5. ALL HEATING AND PLUMBING PIPING SHALL BE NON-COMBUSTIBLE.
6. INSULATE ALL SANITARY EXHAUST DUCTS FROM UNDERSIDE OF ROOF TO 3RD FLOOR (2400mm).
7. PROVIDE A MINIMUM OF ONE WALL MOUNTED THERMOSTAT FOR EACH SUITE.
8. PROVIDE FIRE FLAPS ON EACH 150 x 150mm WASHROOM EXHAUST AIR GRILLE.
9. HEATING, VENTILATING AND AIR-CONDITIONING EQUIPMENT SHALL CONFORM TO THE APPROPRIATE REQUIREMENTS OF THE PROTECTION ACT AND REGULATIONS MADE PURSUANT TO THAT ACT.
10. AIR FROM ONE SUITE SHALL NOT BE CIRCULATED TO ANY OTHER SUITE NOR TO A PUBLIC CORRIDOR.
11. AIR CONTAMINANTS RELEASED WITHIN BUILDINGS ARE TO BE REMOVED AS FAR AS POSSIBLE AT THEIR POINTS OF ORIGIN AND SHALL NOT BE PERMITTED TO ACCUMULATE IN UNSAFE CONCENTRATIONS.
12. SELF-CONTAINED MECHANICAL VENTILATION SYSTEMS, SUCH AS KITCHEN AND BATHROOM EXHAUST FANS, SERVING ONLY 1 DWELLING UNIT SHALL CONFORM TO THE REQUIREMENTS OF SECTION 9.3.3.



BASEMENT FLOOR PLAN
MECHANICAL LAYOUT
SCALE 1"=50'

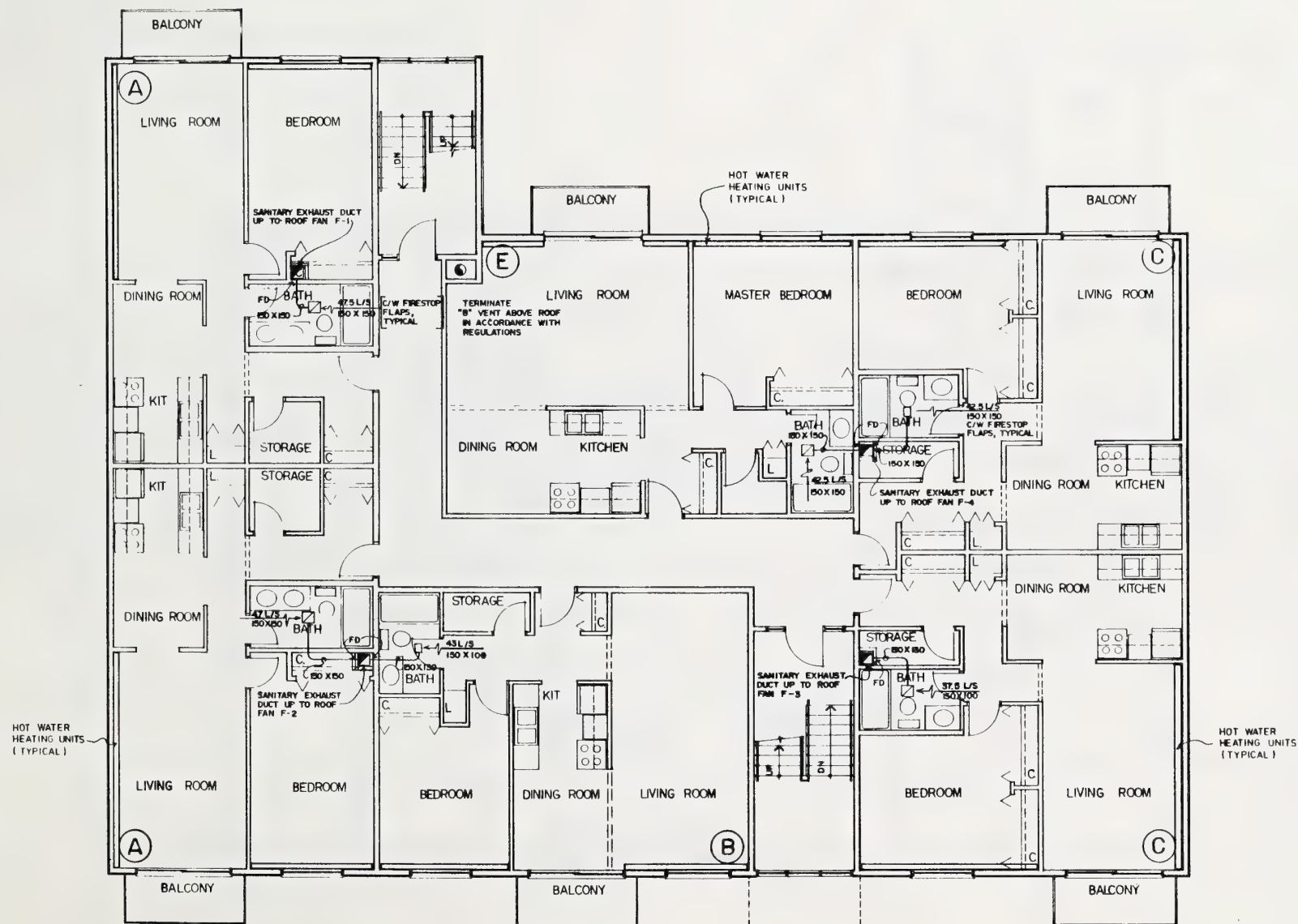




ALBERTA HOUSE COST COMPARISON STUDY

MAIN FLOOR PLAN
MECHANICAL LAYOUT
SCALE 1" = 50'

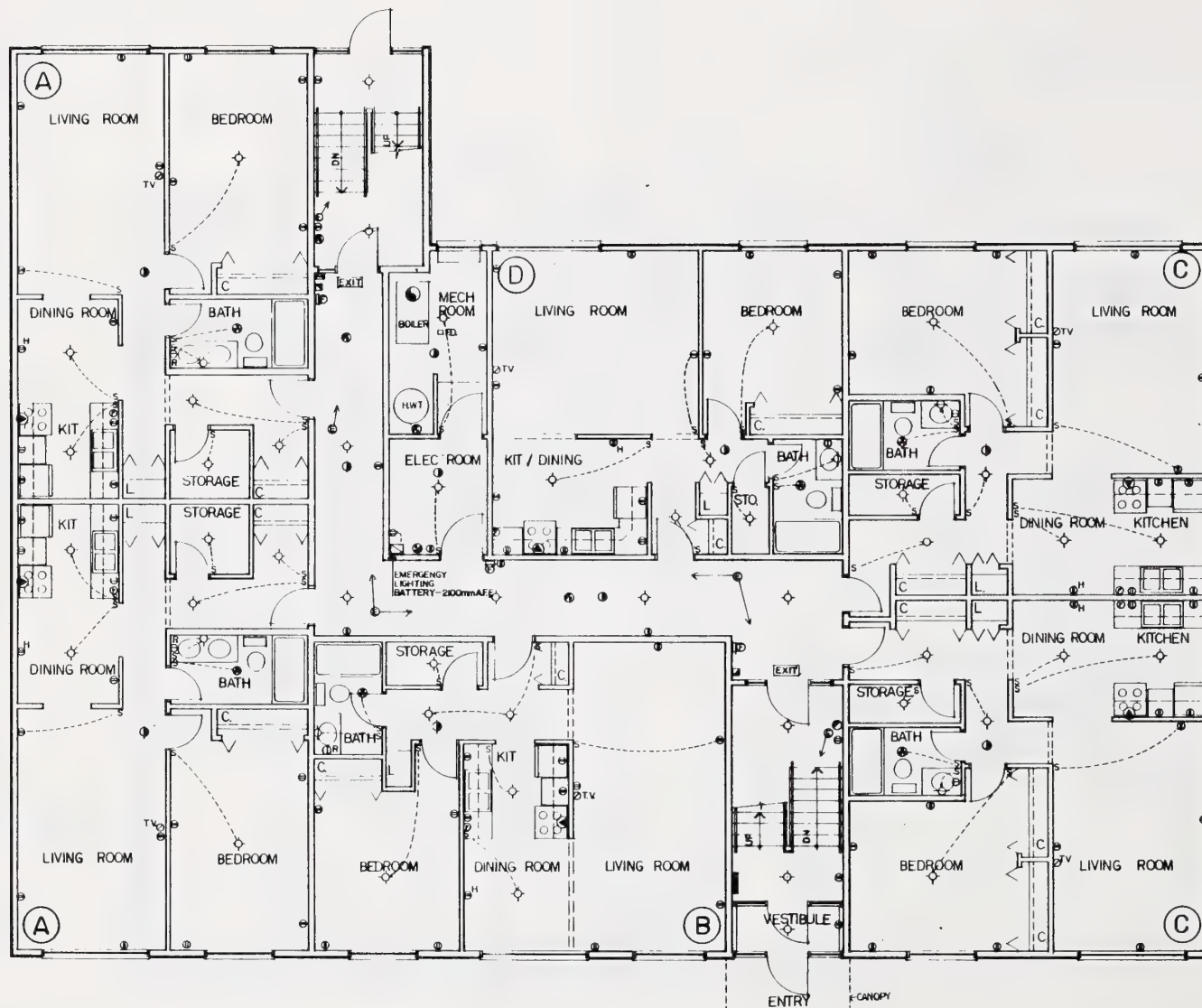




ALBERTA HOUSE COST COMPARISON STUDY

2ND & 3RD FLOOR PLAN
MECHANICAL LAYOUT
SCALE 1" = 30'



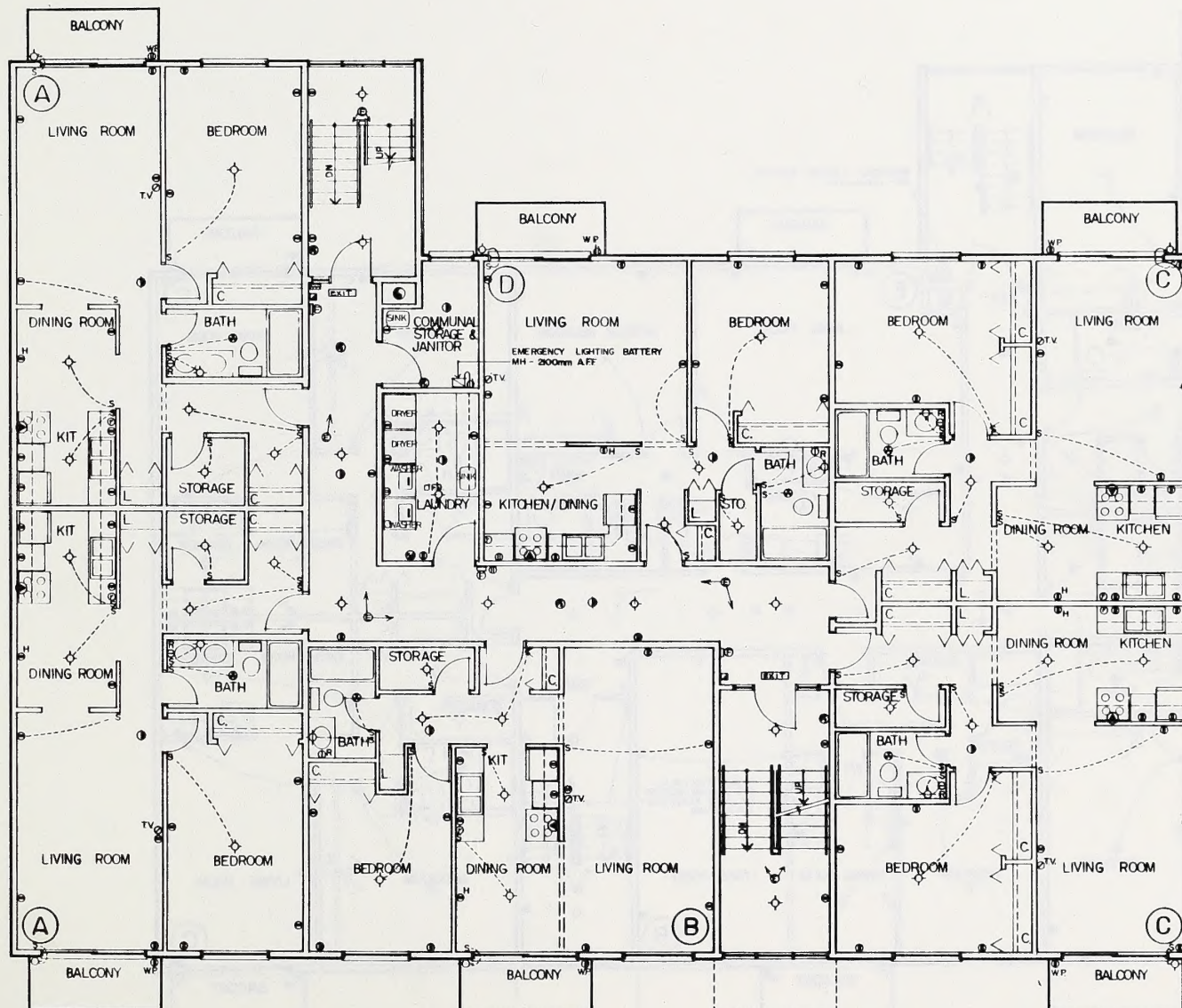


- ELECTRICAL LEGEND**
- EXIT LIGHTS WITH 2-25W - 120V AND 1 12V-15W EMERGENCY POWER SUPPLY
 - EMERGENCY LIGHTING HEAD, 12V-12W
 - EMERGENCY LIGHTING, 2 HEADS, 12V-12W
 - SMOKE ALARM
 - MANUAL FIRE ALARM STATION
 - FIRE ALARM BELL, 254MM DIA-METER
 - END-OF-LINE RESISTOR
 - MASTER FIRE ALARM PANEL C/W ANNUNCIATOR AND GEL CELL BATTERY AND 120V POWER SUPPLY AND AUTOMATIC CHARGER, 1 ZONE PER FLOOR, 2 ZONES - STAIRS

ALBERTA HOUSE COST COMPARISON STUDY

BASEMENT FLOOR PLAN
ELECTRICAL LAYOUT
SCALE 1"=5'

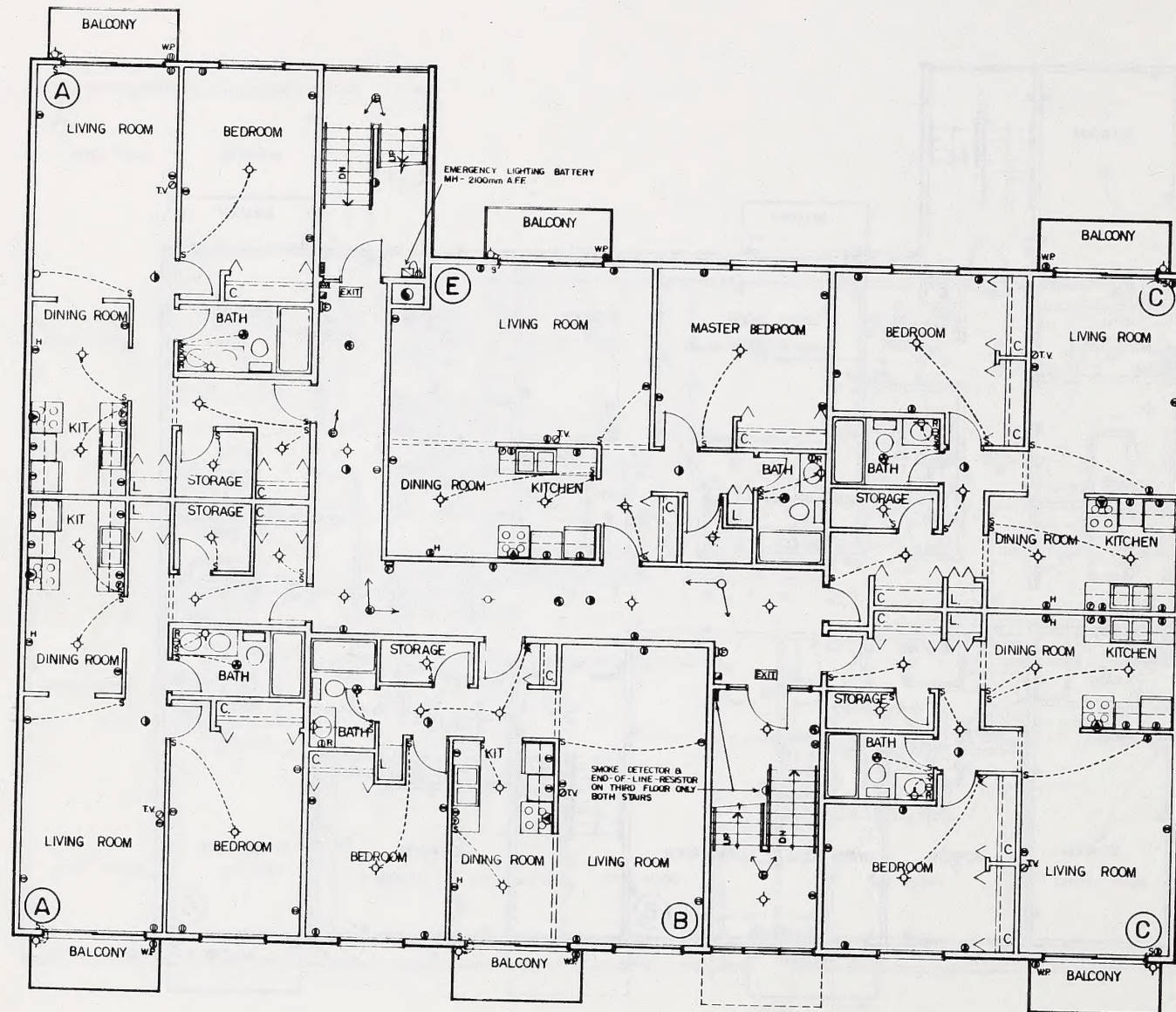




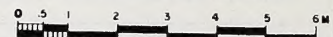
ALBERTA HOUSE COST COMPARISON STUDY

MAIN FLOOR PLAN
ELECTRICAL LAYOUT
SCALE 1" = 50'





ALBERTA HOUSE COST COMPARISON STUDY
 2ND & 3RD FLOOR PLAN
 ELECTRICAL LAYOUT
 SCALE 1"=30'



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